UPPER TENMILE CREEK

Operable Unit Number Two
Rimini Superfund Site

Helena, Montana

Value Engineering Study
For
U.S. Environmental Protection Agency
Region Eight, Montana State Office

Study Date: April 17-19, 2007

Final Report

July 23, 2007

US Army
Corps of Engineers

US Environmental
Protection Agency

EXECUTIVE SUMMARY

General

The United States Army Corp of Engineers (USACE) Hazardous, Toxic, and Radioactive Waste (HTRW) Center of Expertise (CX) performed a Value Engineering Screen and Study (VE Study) on the Upper Tenmile Creek – Rimini Superfund Site, Operable Unit Number Two (OU 2) project located 9 miles west of Helena, MT on US Highway 12. The VE Study was conducted at the United States Environmental Protection Agency (USEPA) Region 8, Montana State office in Helena, MT on April 17 - 19, 2007. The study included a visit to the community of Rimini on April 17 led by the Remedial Project Manager (RPM) and lead designer.

A VE Study is based on the principles and standards used in the VE Study process which consists of six phases. The EPA VE process is broken into two components, the screening phase that addresses the first four phases (Information Gathering, Function Analysis, Speculation, Analysis) and the study phase that encompasses the final two phases (Development and Presentation). VE studies the functions of individual items of a project and the relationships of those functions to the overall function of the project. The result of studying the functions allows the team to take a critical look at how these functions are being met and therefore develop alternative ways to achieve the same function while increasing the value and maintaining the primary function of the project. In the end, it is expected that the project will realize: 1) a reduction in cost, 2) increase or maintain the execution of the primary function, and 3) improve or maintain the biddability, constructability and maintainability of the completed operable unit thereby improving the site environment.

Another objective in executing a VE study is to meet the requirements of Office of Solid Waste and Emergency Response (OSWER) Directive OSWER 9335.5-24, Value Engineering for Fund Financed Remedial Design and Remedial Action Projects dated 14 April 2006. The VE process can accomplishes these objectives within the existing design schedule. Preliminary proposals and comments resulting from a VE Study are briefed to the primary stakeholder, the EPA, for comment and content, then screened to eliminate those proposals considered to be outside the scope of the study prior to full development. The resulting proposals are then developed and provided to the EPA RPM, remedial action design team, or others designated by the RPM for comment.

Following review comment incorporation, the final report is presented to the designer for incorporation within the preliminary draft design documents concurrently with comments from the EPA, USACE, State, or other stakeholders with no impact on the overall schedule, to the extent that is possible. The RPM is then requested to prepare a written response for the record that explains reasons for accepting or rejecting each VE recommendation (or task a contractor or the project designer to prepare such a response), and send this written response to Lindsey Lien, Leader of the USACE VE Team.

Estimate of Construction Costs and Budget
The total projected construction cost for all the required work at Rimini for OU 1 and 2 is approximately $13.8 million. The following costs are approximate, very rough estimates, but represent the order of magnitude for this remediation.

Work accomplished to date	
Waste removal in yards	$4.0 mil
Waste water treatment plant (part)	$1.2 mil
Work to be accomplished	
Waste Water Plant, Water Piping, Removing waste from Road	$7.6 mil
Oversight/ Testing	$1.0 mil
Total	$13.8 mil

Summary of VE Study Results
During the speculation phase of this study, 91 creative ideas were identified. Fourteen of these ideas were developed into VE recommendations with cost implications where applicable. Thirty-one ideas were developed into design comments

The following table presents a summary of the ideas developed into recommendations with cost implications where applicable. Cost is one of the important issues for comparison in VE proposals. The costs presented in this report are based on a several factors. Where current detailed cost with quantities were available based on the January 2007 cost estimate, those costs were used. Some cost estimates that required development of options not addressed in the present cost estimate were prepared from published cost databases, vendor information, design reference material and VE team member experience. The estimates provided should be of sufficient detail to allow a decision regarding implementation.

In addition to the Summary of Recommendations, several ideas were developed that were not viable. These developed ideas are included in Appendix E as “Withdrawn Recommendations”. They are included in the report to document the logic of why the recommendation was withdrawn.

SUMMARY OF RECOMMENDATIONS

RECOMMEN-DATION NUMBER	DESCRIPTION	POTENTIAL SAVINGS (COST)
1	Install all service connections using a cost reimbursable contract.	$32,036
2	Revise water and sewer line alignments to allow the existing 18-inch Helena raw water line to remain in place, and do not install the temporary bypass.	$604,887
3	Screen out oversized material from contaminated stockpile.	$18,782
4	Reevaluate capital costs versus O&M costs for surface water versus well water, or a combination thereof.	$98,317
5	Look at alternative piping materials for the transmission pipeline between the Ruby Creek Well and the 50,000 gallon reservoir.	$506,544
6	Use vacuum extraction for soil excavation around the existing septic areas in lieu of traditional methods.	$0
7	Combine two or more properties to sewer main laterals where possible.	$9,600
8	Combine two or more properties to water service secondary mains where possible.	$7,600
9	Insulate water supply/transmission lines between Ruby Creek (or other locations as applicable) to facilitate shallower burial depth than that required to be below frost depth.	$100,000
10	Place power lines in the same trench as the water transmission pipeline. Install the power line using an approved subcontractor in lieu of having the utility company install the power line.	$96,000
11	Hire Helena city workers to operate these systems.	See Recommend-ation
12	Delete water meters at the individual services.	$23,400
13	Use Pre-engineered well house versus CMU.	$39,000
14	Install a temporary intake structure for the Helena city water supply downstream of the Rimini utility work and connect to the 18-inch Helena water supply line, allowing work to occur within Rimini with an empty pipeline.	($110,281)

Total Potential Savings is not computed because some of the recommendations are mutually exclusive of one another.

Acknowledgments
As this is one of the first studies of this kind, a VE Study on a HTRW project, the study members should be commended for their effort and perseverance in accomplishing this very successful study. Special thanks are extended to the EPA RPM, the designer and field engineer from the design firm, CDM, for their cooperation and full participation in this team VE Study effort. Combined with team members from the EPA-HQ, USACE HTRW CX, Sacramento, Baltimore, and Omaha Districts, these experts shared information with each other and generated several significant ideas that will improve the value of this remediation.

While team members formally conducting the VE Study must be independent from the design team, the designer(s), EPA RPM and other technical personnel are always encouraged to participate in these studies to the maximum extent possible in order to provide background design information and Superfund policy support to the team. The combined efforts of all of these individuals are what produced the value added results of this study.

Significant Aspects of the VE Study
The participation of both the EPA RPM and representatives from the design firm, CDM, had a very positive effect on the outcome of this study. The study team attempts to become familiar with the project prior to the start of the study on site. But the people with the best first hand information about any project are the owners, designers, and possibly some stakeholders. Having them present to provide the VE team with background design information and Superfund policy support not only provides valuable insight, but assists in rapid solution to technical issues.

Value Engineering Screening Study Team Members

NAME	**ORGANIZATION**	
Ken True	CVS,	Contractor
Lindsey K. Lien	USACE-HTRW CX,	Team Coordinator
Curtis Payton	USACE CESPK,	Hydrogeologist
John Hartley	USACE CENWO,	Construction Manager, Rapid Response
Tim Gallagher	USACE CENAB,	Construction Engineer
Mike Bishop	USEPA	RPM
Neil Marsh	CDM,	Design
Dave Swanson	CDM,	Construction
Ed Hanlon	USEPA, HQ	Team Member

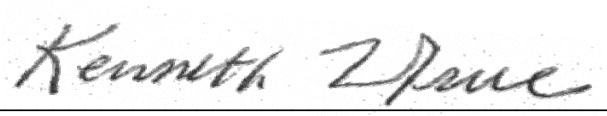
NOTICE
Application of Results of this Value Engineering Study

This VE Study constitutes a review of preliminary draft design documents at this point in time. As with all VE studies, the preliminary draft design documents are reviewed using

VE principles in an effort to improve its overall value and worth. Numerous recommendations for changes and design comments have resulted from this effort. The team believes these end results add to the overall value and goals of this project. However, this effort does not in any way constitute or imply approval, consent, or acceptance of the preliminary draft design documents by any of the team members or the organizations that they represent. Nor does acceptance of any of the recommendations and design comments imply that the preliminary draft design documents are therefore approved. It is the team's position that incorporation of the recommendations and design comments into the preliminary draft design documents would potentially aid in the approval process.

Certification

This is to verify that this Value Engineering Screening Study was conducted in accordance with standard Value Engineering principles and practices.



Kenneth True, PE, CVS, CCE
Value Engineering Screening Study Team Leader

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SECTION 1 – INTRODUCTION

This report documents the results of the VE Study, on the project Upper Tenmile Creek – Rimini Superfund Site, Operable Unit Number Two (OU 2). The project is located 9 miles west of Helena, MT on US Highway 12, and 8 miles north. The VE Study was conducted at the USEPA Region 8, Montana State Office in Helena, MT on April 17 - 19, 2007. The study included a site visit to the community of Rimini on April 17, led by the RPM and lead designer. The study team included persons from the EPA-HQ, USACE HTRW CX, Sacramento, Baltimore, and Omaha Districts, the EPA RPM, the design consultant CDM, and was facilitated by Kenneth True, a Certified Value Specialist (CVS) and Professional Engineer. The names and telephone numbers of all participants in the study are listed in Appendix A.

The Job Plan

This study followed the basic VE methodology as endorsed by the Society of American Value Engineers (SAVE) International, the professional organization of Value Engineering. This report does not include any detailed explanations of the VE processes used during the workshop in development of the results presented herein. A summary of the basic processes used in the study are included to give the reader an idea of the standard VE methodology which consists of six phases:

Information Phase: The VE team studied the Draft Record of Decision (ROD) forwarded to Headquarters EPA via memo dated March 14, 2007, portions of the Remedial Investigation and Feasibility Study, EPA criteria documents, figures, descriptions of project work, and the 90% drawings including the most recent cost estimate dated January 2007 to fully understand the project scope and required functions. This phase was largely done by the team prior to the on-site portion of the VE Study.

Function Analysis Phase: The purpose of this phase is to clearly identify the function(s) of the project and to formulate a concept from which new directions can be taken. A Function Analysis System Technique (FAST) Diagram is an end product of the Functional Analysis Phase. The FAST Diagram is included in Appendix C.

Speculation Phase: The brainstorming session generated ideas that could potentially be beneficial to the remedial action. All team members contributed ideas and critical analysis of the ideas was discouraged until the Analysis Phase (see Appendix B).

Analysis Phase: Evaluation, testing, and critical analysis of all ideas generated during speculation was performed to determine the potential for savings or improvement to the site remediation. Ideas that did not survive critical analysis were eliminated. Those feasible ideas which survived the analysis phase were then developed into recommendations. These surviving ideas were assigned to members of the team for further development and validation of the merit of the recommendations. Sometimes this attempt to substantiate the recommendation results in the modification or even elimination of the original idea. This is considered the end of the VE screening phase.

Development Phase: This step begins the VE Study phase. Ideas were developed enough on site to determine that they were worthy of refinement. After returning to their individual offices, the VE Team members completed development of the surviving ideas into written recommendations. Recommendation descriptions, along with technical support documentation, and cost estimates were prepared to support implementation of ideas. Development takes the form of a written document that clearly expresses the proposed idea, with a "Before" and "After" description. In addition, the VE Team identified items of interest as Comments that were not developed as recommendations. These comments follow the study recommendations.

Presentation Phase: This portion of the study was done in a short presentation during the afternoon of April 19 by the team to the EPA Region 8, Montana Office Director, and Montana Department of Environmental Quality. The recommendations were in draft form at the time of the presentation. This report will be distributed for review by the EPA to project supporters and decision makers. The EPA will determine responsibilities for implementation of accepted proposals.

This study differs slightly from a standard VE study. The differences lie in the applications of some of the VE methodologies and the way they can be applied to an ongoing HTRW Superfund site that has numerous operable units. In order to streamline the process, a preliminary conference call was held to discuss the site with the design team and RPM. Also the information phase consisting of a review of existing documents was nearly completed by the time the team assembled at the site, reducing study travel costs. The recommendations were initially developed during the April 17-19 meeting, screened, and completed adequately to brief the concepts to the Region 8 Montana Office Director and Montana DEQ during the afternoon of April 19. The final recommendations were fully developed when the team members returned to their offices. In any case, the results should be considered as completion of a Value Engineering Study for this site.

Boundary of the Study

This VE study was performed for OU2, wastewater treatment plant completion, sanitary sewer line installation, Rimini potable water supply system components, water line installation, Helena city raw water supply line relocation, and completion of contaminated waste removal from individual properties and Rimini Road. The study did not address the remediation areas other than the Rimini site.

Ideas and Recommendations

Part of the VE methodology is to generate as many ideas as is practical, evaluate each idea, and then select as candidates for further development only those ideas that offer added value to the project. If an idea thus selected, turns out to work in the manner expected, that idea is put forth as a formal VE recommendation. Recommendations represent only those ideas that are proven worthy to the VE team's satisfaction.

Design Comments

Some ideas that are not developed as recommendations are worth further consideration. These ideas have been written up as Design Comments and are included in Section 4.

Level of Development

VE Studies are working sessions for the purpose of developing and recommending alternative approaches to a given project. As such, the results and recommendations presented are of a conceptual nature, and are not intended as a final design. Detailed feasibility assessment and final design development of any of the recommendations presented herein, should they be accepted, remain the responsibility of the EPA and the designer.

SECTION 2 – PROJECT DESCRIPTION

Background

This report presents the results of the VE Study on the project Upper Tenmile Mining Area OU2 National Priorities List (NPL) site located near Helena, Montana. A VE Study is intended to add value to projects, in terms of improved quality, enhanced construction methods, reduction in waste volume generated, or money expended on the remediation process. This VE Study was done as part of a pilot program funded by HQ EPA, and coordinated by EPA Region 8 and the USACE HTRW-CX.

Authority for the performance of these studies is contained in the OSWER (Office of Solid Waste and Emergency Management) Directive OSWER 9335.5-24, Value Engineering for Fund Financed Remedial Design and Remedial Action Projects, signed on 14 April 2006. This directive provides guidance concerning requirements addressing VE for Superfund Remedial Design and Remedial Action Projects.

Project Description

Upper Tenmile Creek Mining Area Site is in Lewis and Clark County, Montana. The national Superfund database identification number for this Site is MTSFN7578012. The site, southwest of Helena Montana, includes the upper Tenmile Creek drainage basin south of U.S. Highway 12. The site covers about 53 square miles and contains 150 known abandoned or inactive mine sites within or near the historic Rimini Mining District in the Upper Tenmile Creek watershed. The watershed serves as the primary source of water for the City of Helena.

A ROD for the site was signed on June 28, 2002. It addressed only the elements of the selected remedy that pertain to the community of Rimini and the Landmark Subdivision. Some remediation was accomplished in 2005/2006. Due in part to draft analyses prepared by EPA after the June 2002 ROD related to the community water and wastewater treatment systems, and due to differences between costs presented in the 2002 ROD and actual costs of removal activities in residential yards, a draft ROD Amendment document was prepared. This document summarizes potential amendments for certain components of the 2002 ROD's selected remedy. EPA has not yet prepared a proposed plan associated with these potential amendments to the 2002 ROD's selected remedy. A preliminary draft design document which includes draft drawings and specifications was prepared in February 2007 based on the selected remedy in the 2002 ROD, and based on potential remedial components described in the draft ROD Amendment document. This VE study is based on those documents.

A complete site cleanup history and proposed remedy is stated in the ROD and draft ROD Amendment document. A very short history is included herein. Most historic mining activity in the watershed took place within the Rimini Mining District and included hard rock mining for gold, lead, zinc, and copper. Active hard rock mining began in the 1870's and continued through the 1930's. The last active commercial mining in the area ended in 1953. The result of all this activity has been the contamination of ground and surface waters as well as contamination of yards and roads.

Investigations at the site have documented releases of hazardous substances containing elevated concentrations of arsenic and metals (cadmium, copper, lead, zinc, and others) that may pose risks to human health and the environment. Contaminants of Concern (COC's) have been

observed to exceed established human health or environmental standards, including EPA's maximum contaminants levels (MCL) for drinking water and state water quality criteria for aquatic life. These COC's are derived primarily from uncontrolled sources of waste rock, tailings, acid mine drainage, acid rock drainage, and contaminated groundwater, surface water, soil, and stream sediments.

The remedial components associated with the Rimini community, as noted in the draft ROD Amendment document and preliminary draft design document, includes removing the waste from yards and roads, construct a community water system to replace individual contaminated ground water supplies, water supply wells, and construct a small community wastewater system to replace existing individual septic systems damaged during the removal of contaminated yard soils.

There is a significant difference between the estimated cost for the selected remedy in the 2002 ROD and the actual cost of work to date conducted pursuant to the 2002 ROD, and the revised draft cost estimates to construct the remedy noted in the draft Rod amendment document. These potential cost differences are documented in the draft ROD amendment document and are part of the reason for the execution of this VE study.

Estimate of Remedial Action Costs

The total projected construction cost for all the required work at Rimini for OU 1 and 2 is approximately $13.8 million. The following costs are approximate and or rough estimates but represent an order of magnitude for this remediation.

Work accomplished to date	
Waste removal in yards	$4.0 mil
Waste water treatment plant (part)	$1.2 mil
Work to be accomplished	
Waste Water Plant, Water Piping, Removing waste from Road	$7.6 mil
Oversight/ Testing	$1.0 mil
Total	$13.8 mil

SECTION 3 – VE RECOMMENDATONS

Organization of Recommendations

This section contains the complete documentation of all recommendations resulting from this study. Each recommendation has been marked with a unique identification number. The parent idea, or ideas, from which the recommendation began, can be determined from the Creative Ideas List located in Appendix B of this report. Many of the individual items recorded during the speculation phase have been incorporated together into one recommendation. However, for tracking purposes, the original idea numbers that make up a recommendation are shown within the recommendation.

Each recommendation is documented by a separate write-up that includes a description of both the original design and recommended change, a list of advantages and disadvantages, sketches where appropriate, calculations, cost estimates, and the economic impact of the recommendation on the first cost, and where applicable, the life cycle cost. The economic impact is shown in terms of savings or added cost. In some cases, the recommendation is broken down to include write-ups for each creative idea within the recommendation.

VALUE ENGINEERING RECOMMENDATION # 1

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Install all service connections using cost reimbursable contract.

Creative Idea 3

ORIGINAL DESIGN:

The original design calls for installation of service connections as part of the Invitation For Bid (IFB) contract award.

RECOMMENDED CHANGE:

Utilize cost reimbursable or time and materials type of contracting for installation of service connections.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$384,439		$384,439
RECOMMENDED DESIGN	$352,043		$352,043
ESTIMATED SAVINGS OR (COST)	$32,036		$32,036

VALUE ENGINEERING RECOMMENDATION # 1

ADVANTAGES:

- Avoid paying contractor contingencies due to a high degree of unknown site conditions.
- Avoid change orders due to site conditions.
- Easier adaptation to changed site conditions.

DISADVANTAGES:

- Requires a higher level of oversight and contractor management.
- Actual cost may be higher than anticipated if contractor is not efficient.

JUSTIFICATION:

Each house has its own well and septic systems with no standard connections and the locations of some of the septic systems are not even known. Given this situation it will be extremely difficult to prepare a bid package with enough detail to facilitate an accurate bid without doing additional investigative work at some, if not all, of the homes.

Using the IFB process has the advantage of developing a set price for the work prior to the initiation of the work. However, if bids are requested with a high degree of uncertainty associated with the required level of effort to complete the job, then the bids will be based on assumptions and commonly contain a significant contingency built in to cover the uncertainty. Depending on how the assumptions are worded some homes may require change orders based on changed site conditions which would result in overall cost creep even with a fixed price bid.

Utilization of a cost reimbursable type of contract for completing the service connections allows execution of the work on more of a design build approach with less up front design effort. Since the contractor is only being paid for work performed, there is no contingency built into the contract. While the government bears the risk for cost overruns that risk becomes a function of managing the contractor. If the government takes a proactive approach to site management and ensures that the work is executed efficiently, then it will pay a reasonable cost for the work that will likely be less than would be bid in a fixed price contract.

The cost for the water connections and sanitary connections were $127,747 and $192,619 respectively for a total of $320,366 per the CDM estimate. It is assumed, based on past experience, that a contractor bidding on this work with the current level of unknowns associated with tie in point locations and new utility system tie in incompatibility with the house systems, would add approximately 20% contingency to his bid price in the form of inflated costs. Based on the current CDM estimate that amount would be $64,073. It is likely that some degree of contingency would be warranted due to particularly difficult tie ins. Those same conditions would cause higher cost on the reimbursable contract as well. Given the assumption that half of the contingency would be justified, the projected savings would be $32,036 based on the current estimate.

Elimination of administrative costs associated with change orders would be balanced for additional cost tracking and project management costs.

VALUE ENGINEERING RECOMMENDATION # 2

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Revise water and sewer line alignments to allow the existing 18-inch Helena raw water line to remain in place, and do not install the temporary bypass.

Creative Ideas 47, 16, & 17

ORIGINAL DESIGN:

The Rimini 8-inch sewer main was designed to be located underground on the west shoulder of Rimini Road, with the required 10-foot lateral separation between the sewer main and underground water mains on the east half of Rimini Road. To place the sewer main in the west shoulder location, the draft design required permanent relocation of approximately 3,000 linear feet of an existing City of Helena 18-inch raw water pipeline and installation of a temporary 16-inch water line while the new 18-inch pipeline was installed.

RECOMMENDED CHANGE:

Do not relocate the existing 18-inch concrete raw water line. Do not install a 16-inch HDPE temporary raw water bypass line. Install the new 8-inch sanitary sewer in a new alignment. The recommended new alignment is in the center of Rimini Road. The Rimini community water system main will be located under the east shoulder of Rimini Road, which is approximately 22 feet wide through most of the community. The new 8-inch sewer main will be installed to maintain the 10-foot lateral separation from the Rimini water main (east shoulder) and the Helena raw water line (west shoulder) using this revised alignment.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$1,173,637		$1,173,637
RECOMMENDED DESIGN	$568,750		$568,750
ESTIMATED SAVINGS OR (COST)	$604,887		$604,887

VALUE ENGINEERING RECOMMENDATION # 2

ADVANTAGES:

- Eliminates need to relocate Helena raw water line.
- Eliminates need to build/use/remove temporary raw water diversion line during construction period.
- Currently designed alignment along west shoulder would be difficult to construct because of numerous ROW encroachments along west shoulder (houses, trees, utilities, porches, fences, etc.). Trenching in the center of Rimini Road will be substantially easier.
- Reduces the amount of trenching required to place the water and sewer mains.
- Reduces the number of alignment changes and therefore the number of sewer manholes required by approximately 20 percent.

DISADVANTAGES:

- Will require redesign effort and costs.
- Montana Department of Environmental Quality (DEQ) has approved the current design. Revised design will require another review and approval by DEQ.
- Completing the sewer service connection stub-outs will require more effort, time, and cost because they will have to be placed under the Helena raw water line while it is operating.
- There is a risk the Helena raw water line could be damaged.

JUSTIFICATION:

While there is some risk working near the existing raw water line, the field tests accomplished on the line subsequent to completion of the design document demonstrated the existing line is in excellent condition. Leaving the line in service may in fact pose less of a risk than disruption of service due to temporary lines and relocation. In the unlikely event the line is damaged, a repair of a small section of the line could be done quickly. This recommendation represents a logical engineering solution. This Recommendation can be combined with Recommendation Number 14 if an alternate pipeline connection is deemed necessary.

VALUE ENGINEERING RECOMMENDATION # 2

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Sewer Manholes (-20%)	ea		PE	31	$175,000	25	$140,000
Pipe Installation (-10%)	LF				$0		$0
(trenching efficiency)		$65.06	PE	5,380	$350,000		$315,000
					$0		$0
Temp Diversion Line	LF	$43.20	PE	3,900	$168,500		$0
					$0		$0
18-inch Raw Water Line	LF			2,750	$372,987		$0
18-inch Raw Water Line					$0		$0
Manholes	Ea			16	$83,822		$0
Connect to Raw Water					$0		$0
Line	LS				$2,288		$0
Abandon Old Raw Water					$0		$0
Line	LS				$21,040		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$1,173,637		$455,000
Mark-up *		@			$0		$0
Redesign Costs	25%						$113,750
Total					$1,173,637		$568,750

*no markups were applied because the quoted prices were “project costs”

Savings $604,887

VALUE ENGINEERING RECOMMENDATION # 3

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Screen out oversize material from contaminated stockpile.

Creative Idea 21

ORIGINAL DESIGN:

Specification Section 02111, Road Excavation, Stockpiling and Screening of Materials, paragraph 3.04 states: "Segregate large stones (greater than 12" in diameter) at the excavation or staging area. Transport contaminated waste 12 inches and smaller to Luttrell as specified. Stockpile stones larger than 12" at a location approved by the Engineer. These stones and boulders may be crushed for reuse as backfill on the roadway. Decontaminate boulders prior to crushing using a method approved by the Engineer."

RECOMMENDED CHANGE:

The construction management firm has indicated that the current practice is to manually separate oversized rock greater than 12" from the excavated material and stockpile the oversized for removal by the city. Recommend the utilization of a smaller screen (i.e. 6" - 8") to separate out more oversized material from the excavated waste. Screened material will be decontaminated and backfilled at the current Lee Mountain stockpile area.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$29,702		$29,702
RECOMMENDED DESIGN	$10,920		$10,920
ESTIMATED SAVINGS OR (COST)	$18,782		$18,782

VALUE ENGINEERING RECOMMENDATION # 3

ADVANTAGES:

- Reduces the amount of waste material transported to the Luttrell Depository.
- Reduces the need to dump, spread and compact the material at Luttrell.
- Reduces the amount of imported material needed for backfill.
- Reduces truck traffic (and gasoline use, exhaust, dust generation, safety concerns, etc.) on the haul road.

DISADVANTAGES:

- Increases the size of the separated material stockpile.
- Increases the on-site coordination of stockpiles.
- Requirement to install a smaller screen.
- Increased labor required at the screening operation.
- Minor revision to specifications is necessary.
- Decreased volume within the Luttrell Depository.

JUSTIFICATION:

The requirement to screen oversized material from the excavated material already exists within the contract documents. The decontamination method for the screened oversized material has already been determined by the Engineer, as specified. The environmental and economical advantages (approaching $20,000) outweigh the disadvantages.

Assume that the percentage of inclusive oversized material that falls within the 8” to 12” range is approximately 5 %. The remaining volume of material to be hauled to Luttrell equals approximately 8,700 CY (existing 1,700 CY and 7,000 CY to be excavated from below the current stockpile).. Five percent of this volume equals approximately 435 CY. Assume a cost for transportation from Rimini to Luttrell at approximately $32.00/CY (p. 4; cost estimate). Assume a backfill material cost of $12.00/CY.
*Note – Excavated materials from the utility line installations are not included in this estimate.

VALUE ENGINEERING RECOMMENDATION # 3

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Provide smaller screening equipment.	ea	2,000		0	0	1	$2,000.00
Additional Labor required for screening.	hr	50.00		0	$0	100	$5,000.00
Reduced backfill material.	CY	12.00		435	$5,220.00		$0
Reduced transportation of waste to Luttrell.	CY	32.00		435	$13,920.00		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
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					$0		$0
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					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$19,040.00		$7,000.00
Mark-up		@ 56 %			$10,662.00		$3,920.00
Redesign Costs							
Total					$29,702.00		$10,920.00

VALUE ENGINEERING RECOMMENDATION # 4

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Evaluate capital costs versus O&M costs for surface water versus well water, or a combination of the two to identify the best value for the government.

Creative Idea 30

ORIGINAL DESIGN:

The original design calls for the identification of a water resource with sufficient volume to meet the daily usage needs for a community water system for 50 houses (38 gpm) while eliminating or minimizing the need for treatment to the extent possible. Thirty-seven of the houses would be hooked into the system by USEPA. Storage of a minimum of 33,100 gallons of water is also required. The Draft ROD Amendment (2007) has identified the use of shallow alluvial wells or surface water from Tenmile Creek. The Tenmile Creek surface water would be taken out at the Helena water intake structure. The four potential siting locations for alluvial wells under evaluation are Ruby Creek, Beaver Creek, Upper Tenmile Creek and Minnehaha Creek. The design looks at the suitability of any one of these locations as a source. Other water sources evaluated included bedrock wells and springs. Beaver Creek appears to have been disqualified for further consideration due to access reasons and Upper Tenmile Creek Alluvium has the highest cost compounded by access, electrical distribution and approval issues that would probably also disqualify it. At this time the Ruby Creek Alluvium appears to be considered the most viable option by EPA based on it being used as the basis for an estimate. It may also be the case that, being the mid price option, it was selected as a basis for estimating and the source selection is still open.

RECOMMENDED CHANGE:

Re-evaluate the Tenmile surface water intake structure as a water source.

SUMMARY OF COST ANALYSIS			
Cost derived from draft ROD Amendment Table 5-2 Surface Water Source	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$1,785,714	$15,482/year	N/A
RECOMMENDED DESIGN*	$1,687,397	$18,445/year	N/A
ESTIMATED SAVINGS OR (COST)	$98,317	($3,000)/year	N/A

LC cost not computed because payments (dollars) would be from different sources.
Additional $40,000 needed for source testing if you pursue Ruby Creek Source (surface impact)
Using the Upper Ten Mile Creek would result in additional $40,000 savings.

ADVANTAGES:

- The Tenmile intake structure provides a known source with reliable flows eliminating the need for additional test wells and water source evaluations.
- Close to Rimini with significantly reduced piping requirements.
- Reduced or eliminated electrical line requirements.
- Easy access for winter inspection and maintenance.
- Can coordinate with the Helena water district employees to conduct inspections or Rimini equipment concurrent with inspection of the Helena equipment.
- No need to install, develop and maintain wells.

DISADVANTAGES:

- Potential regulatory issues regarding the impact of surface water and associated treatment requirements on this proposed water supply will need to be clarified.
- Added O&M costs for Rimini associated with filtration requirements.
- Need to purchase water or otherwise negotiate water rights (also a disadvantage for Ruby Creek source).
- Need to modify the intake structure for Rimini withdrawal.

JUSTIFICATION:

Review of the ranking criteria shows the Tenmile Creek City intake to be ranked below the Minnehaha Creek Alluvium but above all others including the Ruby Creek Alluvium.

Review of the cost build up in the 2003 water supply investigation report for the various options and costs provided in table 5-2 of the draft ROD Amendment document shows a significant difference in the estimates for the Minnehaha Creek. In the 2003 reports, capital costs ranged from $1,860,537 for development at the mouth of the creek to $2,128,505 for development at the first tributary. The 2007 costs were for $1,007,667. If the current estimate for the Minnehaha source is correct then it is the obvious source choice given the significantly lower cost. The large swing in the cost estimates between 2003 and 2007 suggests that the estimates need review for accuracy, especially considering the amount of piping and additional power feed requirements for that source and the need to treat for arsenic (As). This source has not been confirmed as not being influenced by surface water. If the source is confirmed as being influenced by surface water, then filtration would be required for this source as well.

The major negatives against using the Tenmile intake surface water source are the cost and complexity of the treatment associated with a surface water source. It does not appear that the Tenmile surface water source has a problem that would offset the O&M for filtration to some degree. Per the USEPA and CDM, the City of Helena water district is willing to run the plant for Rimini. While they may require some additional training, it is likely that they will have enough experience to easily grasp additional requirements of the Rimini system.

VALUE ENGINEERING RECOMMENDATION # 4

Review of the latest treatment cost estimate has revealed a potential error associated with Tenmile surface water treatment costs. A routine inspection is called out for the system on a 2 hr/wk basis which would result in 104 hrs per year not the 260 hrs shown in the estimate. Changing the hours to 104 reduces the O&M cost by $3,900 which makes the O&M for Tenmile surface water less than that for Minehaha and about $4000/yr higher than the other options. Additional reductions in this level of effort may be realized by combining the Rimini system inspection with Helena intake inspections which are regularly conducted by a water district worker (the water district is being considered as the operator of the Rimini plant).

Assuming the cost estimate for the O&M for the Tenmile intake source is correct, the cost difference relative to the lowest O&M cost is $6,500/yr which equates to a surcharge of $10.80/month/household assuming 50 households on the service ($14.65/month/household for 37 connections). If the potential error in the estimate were correct then the surcharge would be $6.60/month/household, ($9.00 /month/household based on 37 connections). This additional cost is unlikely to pose an undue burden on the homeowners, especially in light of the increases to their property values brought about by the utility improvements, and does not justify spending a minimum of $100,000 additional in government funded capital costs to avoid that surcharge.

Taking the capital cost difference between Ruby Creek and the Tenmile surface water source and dividing it by the $4,000 additional O&M costs per year (best case) shows that it takes approximately 25 yrs to recoup the additional capital costs. Twenty-five to thirty years could in some cases be considered the life of a small system. Information on membrane filtration suggested an operational life of the membrane to be 10 yrs. It is likely that new filtration systems will be available prior to that which will reduce anticipated O&M costs.

The Ruby Creek source has issues pertaining to electrical power supply, access, land acquisition, installation of the water main in a shallow refusal area, approvals from the EPA, and sewer and water districts. In addition the Ruby Creek Alluvium has not been confirmed as a viable water source in terms of yield or potential impact from surface water. If the source were determined to be under the influence of surface water, then some or all of the treatment requirements for the surface water source would also apply to Ruby Creek.

The difficult access for most of the alluvial sites would cause concern associated with the ability to make timely repairs during the winter months. Since inspections would be required by snowmobiles in the winter months, the sites would likely need to be helicopter accessible to accommodate any significant repair efforts.

Per discussion held during the VE meetings, it is possible that the City of Helena would entertain discounting the purchase of water for updating of the water control gates in the intake structure which could be performed as the modifications for Rimini water extraction were performed. This would offset some of the capital costs on the intake structure. Since The City of Helena owns the water rights, and water would need to be purchased from them, EPA should evaluate the recharge from the septic leach field back into the hydrologic system when determining net, not gross water utilization by Rimini.

VALUE ENGINEERING RECOMMENDATION # 4

Questions related to the presence of water and the sustainability of the alluvial water source remains unanswered at the alluvial source locations. Determination of the groundwater not being under the influence of surface water cannot be definitively answered until the water source is fully developed. Evaluation of these questions will cost additional money which may or may not be recouped into the project (e.g. a test well could potentially be completed as a supply well) as well as require time to conduct the studies. The cost of these studies needs to be included in the estimate for the development of each of those sources when used in comparison against Tenmile Creek surface water.

VALUE ENGINEERING RECOMMENDATION # 5

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Look at alternative piping materials for the transmission line between the Ruby Creek Well and the 50,000 gallon reservoir.

Creative Idea 34

ORIGINAL DESIGN:

The original design consisted of 10,400 linear feet (LF) of 4-inch diameter transmission line piping. During discussions the length was revised to 13,000 linear feet. The piping used in the design was a proprietary type called "zap lock" for the entire length of the line.

RECOMMENDED CHANGE:

Use high density polyethylene (HDPE) piping instead of "zap lock" pipe material. HDPE will require a second pressure reducing valve station be installed given the high pressure near the water reservoir. All other costs are assumed to be similar (excavation, grubbing, etc).

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$738,544		$738,544
RECOMMENDED DESIGN	$232,000		$232,000
ESTIMATED SAVINGS OR (COST)	$506,544		$506,544

VALUE ENGINEERING RECOMMENDATION # 5

ADVANTAGES:

- HDPE is a flexible pipe not susceptible to uneven excavation conditions.
- HDPE is faster to install.
- HDPE has fewer joints.
- HDPE is not susceptible to corrosion, due to damage to the coating system.
- Joints are welded versus mechanical.

DISADVANTAGES:

- Zap lock is a rigid steel pipe with a higher pressure rating than HDPE.
- HDPE has a lower pressure rating, and would require an additional Pressure Reducing Valve (PRV) Station to reduce pressure within tolerable limits for HDPE.
- PRV stations require maintenance by trained personnel.

JUSTIFICATION:

The HDPE option is much less expensive, provides equivalent service, and is much more forgiving during installation. HDPE pipe has a pressure rating of 160 psi. HDPE is a flexible pipe that will not be subject to coating damage and corrosion, or bridging in imperfect bedding conditions. If HDPE is subjected to repeated point loadings from heavy truck or even local traffic, it will deflect and rebound versus bridge, bend, and eventually pit/corrode. Costs were based on using Ruby Creek and a total of 10,500 LF of piping, and the zap lock piping unit cost of $66.86/LF, pressure reducing station cost of $43,200, from the Jan ’07 estimate and HDPE piping cost of $14.00/LF based on information from Richardson’s Cost Guide. .

A second option is to use part HDPE piping a second pressure reducing station and part zap lock piping. Cost for 6000 LF of HDPE combined with 4400 LF of zap lock piping would result in a savings of $738,544 - $421,384 = $317,160.

VALUE ENGINEERING RECOMMENDATION # 5

Cost Item*	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Option 1 All HDPE							
4” zap lock piping	lf	$66.86		10,400	$695,344	0	$0
4” HDPE**	lf	$14.00		0	$0	10,400	$145,600
Press Red Valve Station piping	ea	$43,200		1	$43,200	2	$86,400
					$0		$0
					$0		$0
Total					$738,544		$232,000
Option 2 6000 LF HDPE/4400 LF zap lock							
4” zap lock piping	lf	$66.86		10,400	$695,344	4,400	$294,184
4” HDPE**	lf	$14.00		0	$0	6,000	$84,000
Press Red Valve Station piping	ea	$43,200		1	$43,200	1	$43,200
					$0		$0
					$0		$0
Total					$738,544		$421,384
*All costs are Proj Costs except as noted							
**Richardson’s Cost Guide							

VALUE ENGINEERING RECOMMENDATION # 6

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use vacuum extraction for soil excavation around the existing septic areas in lieu of traditional methods.

Creative Idea 36

ORIGINAL DESIGN:

The CDM construction manager indicated that backhoes were utilized for removing soils around the septic areas during the prior removal activities.

RECOMMENDED CHANGE:

It seems to be an accepted idea by project personnel that damage to existing septic systems, during contaminated soils removal, is inevitable unless another method of soil removal can be devised. A vacuum truck should be used to remove the contaminated soils from the septic areas.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$0		$0
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)	$0		$0

VALUE ENGINEERING RECOMMENDATION # 6

ADVANTAGES:

- Restored homeowner confidence.
- Increased removal of contaminated materials.
- Avoidance of costly septic repairs.
- Eliminate the necessity to upgrade systems due to damage caused by common excavation methods.

DISADVANTAGES:

- The backhoe (or similar device) will still be necessary to scrape/disturb the contaminated soils for vacuum removal.
- There may be size restrictions on the vacuum hose opening (acts as an unintended screen).
- Additional equipment on owner's property.
- Noise.
- Availability of appropriate equipment and personnel.

JUSTIFICATION:

Utilization of backhoes to remove the contaminated soils around the existing septic systems has been met with some resistance by otherwise-willing property owners. By using a less intrusive device (the vacuum hose will pull the loosened soil from the surface) to remove the contaminated material the property owner's confidence may be restored. It should be noted that use of the backhoe teeth (or other intrusive method) would be required to scrape or disturb the contaminated material in order to facilitate the vacuum suction.

*A cost estimate has not been included in this recommendation. Initial analysis suggests that the additional cost associated with the vacuum equipment is offset by the savings from the (probable) septic system repairs (or replacement).

VALUE ENGINEERING RECOMMENDATION # 7

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Combine two or more properties to sewer main laterals where possible.

Creative Idea 48

ORIGINAL DESIGN:

Most of the properties are served by a single individual sewer service connected directly to the 8-inch sewer main in Rimini Road.

RECOMMENDED CHANGE:

In some locations, particularly in the southern portion of Rimini Road, it may be possible to reduce the length of individual service pipeline required by connecting several properties to a sewer lateral, which then is connected to the 8-inch main.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$192,000		$192,000
RECOMMENDED DESIGN	$182,400		$182,400
ESTIMATED SAVINGS OR (COST)	$9,600		$9,600

ADVANTAGES:

- Reduces the length of sewer service line materials, trenching, and installation by approximately 5 percent.
- Minimizes disruption of prior remediated and reclaimed properties.

DISADVANTAGES:

- Providing sewer service lines through adjacent properties will require that permanent easements be granted by neighbors or permanent easements be established by the water and sewer district. Such easements sometimes become contentious, especially if one property must be excavated in the future for maintenance related to use by the adjacent property owner.
- It is assumed that the water and sewer district would own the sewer lateral. The district may prefer to limit its facilities to road ROW locations only and require all property owners to own all facilities between the stub-outs and the houses, including any laterals connecting several houses.
- Will require minor redesign effort and cost.

JUSTIFICATION:

The disadvantage is considered minor in relation to the expected cost savings.

VALUE ENGINEERING RECOMMENDATION # 7

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Sewer Service Line (-5%)					$192,000		$182,400
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
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					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$192,000		$182,400
Mark-up		@			$0		$0
Redesign Costs							
Total					$192,000		$182,400

VALUE ENGINEERING RECOMMENDATION # 8

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Combine two or more properties to water service secondary mains where possible.

Creative Idea 49

ORIGINAL DESIGN:

Most of the properties are served by a single individual water service connected directly to the community water main in Rimini Road.

RECOMMENDED CHANGE:

In some locations, particularly in the southern portion of Rimini Road, it may be possible to reduce the length of water service connection lines required by connecting several properties to a water service secondary main, which then is connected to the water main in Rimini Road.
.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$152,000		$152,000
RECOMMENDED DESIGN	$144,400		$144,400
ESTIMATED SAVINGS OR (COST)	$7,600		$7,600

ADVANTAGES:

- Reduces the length of water service line materials, trenching, and installation by approximately 5 percent.
- Minimizes disruption of prior remediated and reclaimed properties.

DISADVANTAGES:

- Providing water service lines through adjacent properties will require that permanent easements be granted by neighbors or permanent easements be established by the water and sewer district. Such easements sometimes become contentious, especially if one property must be excavated in the future for maintenance related to use by the adjacent property owner.
- It is assumed that the water and sewer district would own the secondary water mains. The district may prefer to limit its facilities to road ROW locations only and require all property owners to own all facilities between the curb stops and the houses, including secondary mains.
- Will require minor redesign effort and cost.

JUSTIFICATION:

The disadvantages are considered minor in relation to the expected cost savings.

VALUE ENGINEERING RECOMMENDATION # 8

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Water Service Line (-5%)					$152,000		$144,400
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
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					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$152,000		$144,400
Mark-up		@			$0		$0
Redesign Costs							
Total					$152,000		$144,400

VALUE ENGINEERING RECOMMENDATION # 9

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Insulate water supply/transmission lines between Ruby Creek (or other locations as applicable) to facilitate shallower burial depth than that required to be below frost depth.

Creative Idea 58

ORIGINAL DESIGN:

The current design calls for trenching the pipeline into the existing Forest Service road to a design depth of 6 feet 6 inches. The depth to rock is not certain but is an average of 2 ft in Rimini.

RECOMMENDED CHANGE:

Use an insulated pipe to allow for shallower excavation depths in rocky areas and to facilitate mounding over the pipeline to provide necessary cover where bedrock is competent and would require blasting. In areas where piping may be exposed additional protection can be attained through the use of heat trace tape within an insulation layer or within the actual pipe.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)	$100,000		$100,000

ADVANTAGES:

- Reduces the volume of competent rock that would require blasting and reduces the associated worker risk.
- Facilitate the use of built up cover to reduce rock excavation and/or blasting and minimize trench excavation.
- Heat trace or insulation may be used on less than the entire pipe run depending on the outcome of heat loss calculations.

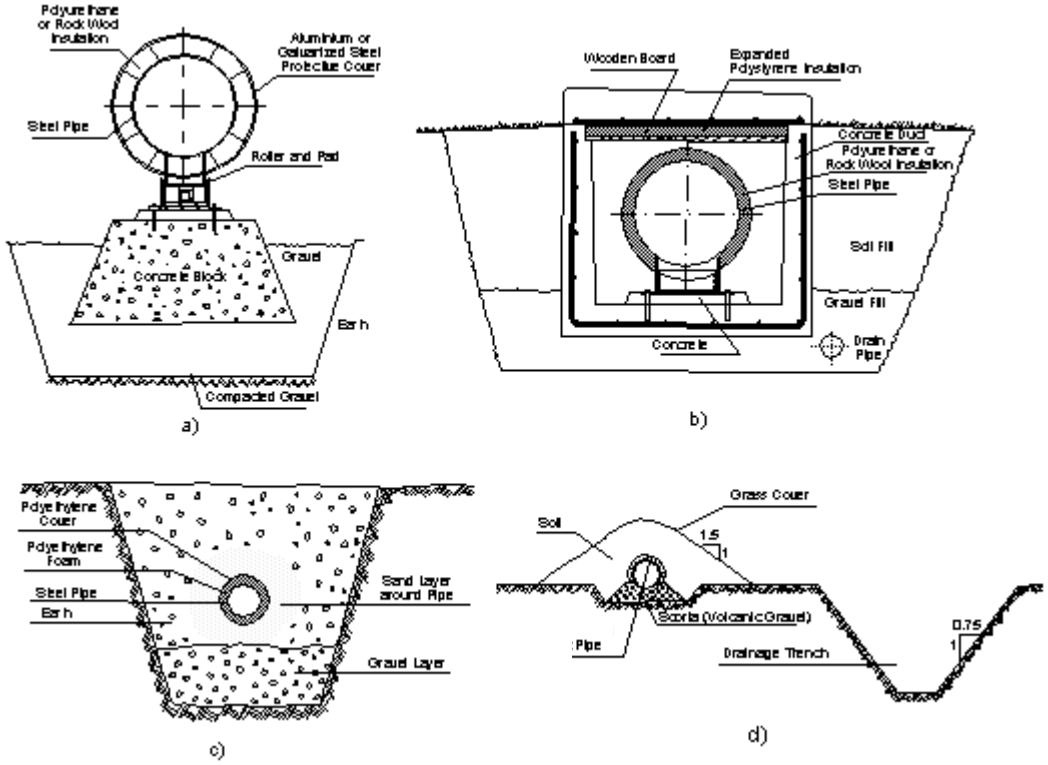
DISADVANTAGES:

- Appropriate insulation system may not be readily available and may require a long lead time.
- Insulated pipe is much more costly to install than un-insulated pipe.
- Availability of specialty pre insulated piping may require long distance shipping with associated costs.
- Suppliers will be hesitant to warrantee a product.
- The new Sewer and Water District will be hesitant to accept a system without warranty.

JUSTIFICATION:

The proposed water supply system would be comprised of three or more groundwater wells or a surface water source, a water supply main and a pre-treatment storage tank. The water source currently deemed most viable will require the installation of a pipeline through an area of shallow bedrock. Trenching through the bedrock may be possible if the upper surface is sufficiently weathered to allow for ripping of the rock with a dozer prior to trenching. If the rock is competent, then a trench would need to be blasted into the rock. The pipe would need to be bedded on the rock surface and buried beneath imported fill.

VALUE ENGINEERING RECOMMENDATION # 9



Examples of above and below ground pipelines are shown: a) aboveground pipeline with sheet metal cover, b) steel pipe in concrete tunnel, c) steel pipe with polyurethane insulation and polyethylene cover, and d) pipe with earth and grass cover.

As an alternative to deep trenching, an insulated pipe could be installed in a shallower trench with additional soil cover, in a constructed pipe chase or above ground.

COST EVALUATION

Assumptions:

5000 LF of rock excavation at $40/LF to 7’ depth	$200,000
Cost to insulate 5000’ shallow pipeline @ $20/LF	$100,000
Net Savings	$100,000

VALUE ENGINEERING RECOMMENDATION # 10

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Place power lines in the same trench as the water transmission line (offset) from the power source to the Ruby Creek well using a subcontractor approved by the power company versus having the power company install the power line.

Creative Idea 61

ORIGINAL DESIGN:

The original design required the Northwest Energy Power Company be responsible for installing the underground power feed to the Ruby Creek well. The underground feed would be installed in a separate trench adjacent to the pipeline.

RECOMMENDED CHANGE:

Identify an electrical subcontractor approved by the Northwest Energy Power Company to install the power feed from the power source to the Ruby Creek well. Also eliminate the requirement for separate trenches for the water and power lines.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$278,000		$278,000
RECOMMENDED DESIGN	$182,000		$182,000
ESTIMATED SAVINGS OR (COST)	$96,000		$96,000

VALUE ENGINEERING RECOMMENDATION # 10

ADVANTAGES:

- Reduces time needed to install the water and power lines.
- Eliminates the need to excavate two trenches through rough terrain consisting of cobbles and rock which is very treacherous.
- Reduces the number of trees removed or damaged.

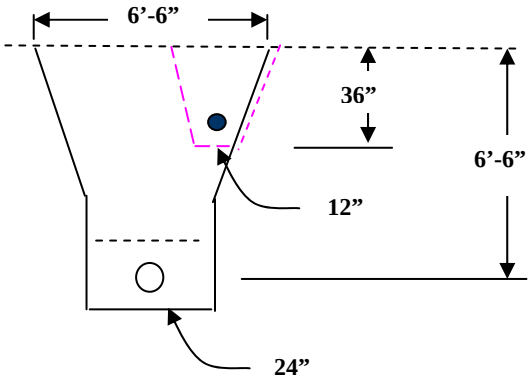
DISADVANTAGES:

The two lines, water and power, will be in close proximity to each other in the trench. If a repair is needed on the water line, the power line may be more susceptible to damage during excavation.

JUSTIFICATION:

Conversations were held between the VE Team and the power company. The power company had no objections to the revised installation arrangement. The power line should be marked with a plastic ribbon tape above the line, but the installation in the same excavation as the water line is acceptable. The use of a contractor from a recommended/approved roster maintained by the utility company would also be acceptable. Installation in the same trench would significantly reduce the workers' exposure to working in hostile environs (steep, slippery slopes, heights and etc). In the event that Recommendation 9 (shallow burial) is accepted, the trench may need to be widened to accommodate the power line.

VALUE ENGINEERING RECOMMENDATION # 10



Not to Scale

2 V x 1 H side slopes assumed from 2’ above the top of the 4” pipe. Side slopes encompass entire excavation for the power line at a depth of bury of 3’. Excavation saved, assuming no side slopes for the power = (13,000 x 3 x 1)/27 = 1440 CY.

Savings from subcontractor installing the power is $6/LF. Utility charges $20/LF, contractor cost is $14/LF.

VALUE ENGINEERING RECOMMENDATION # 10

Cost Item**	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Power Line Excavation*	cy	$12.50		1440	$18,000	0	$0
Difference in cost for *** Utility to install the power to private contractor	lf	$20.00		13,000	$260,000	13,000 lf @$14.00 Per lf	$182,000
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
*estimate using unit cost for excavation of individual water line services					$0		$0
					$0		$0
**All costs are Proj Costs					$0		$0
					$0		$0
***Quote from Power Co					$0		$0
					$0		$0
Subtotal					$278,000		$182,000
Mark-up		@			$0		$0
Redesign Costs							
Total					$278,000		$182,000

VALUE ENGINEERING RECOMMENDATION # 11

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Hire Helena city workers to operate these systems.

Creative Idea 77

ORIGINAL DESIGN:

Concepts:

- Train local resident.
- Hire operators from Helena.
- Utilize existing operators located at City of Helena Tenmile plant.

RECOMMENDED CHANGE:

Have the Sewer and Water District negotiate with the City of Helena and contract for City water and wastewater operators to support the Rimini community.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	0		
RECOMMENDED DESIGN	0		
ESTIMATED SAVINGS OR (COST)	0		

Refer to the table in the Justification Section of this Recommendation for costs.

VALUE ENGINEERING RECOMMENDATION # 11

ADVANTAGES:

- Reduction in travel time for operator.
- No need to pay for training (ongoing) of an operator.
- Minor adjustment to Helena' operator's duties (normally travels past Rimini daily).

DISADVANTAGES:

- Operator not under direct management control of Water and Sewer District (may have priority conflicts).
- Question of how long term the relationship might endure.

JUSTIFICATION:

More cost effective rate of O & M to the community, comparing the cost of a Helena city worker, a local person from Rimini, and a contracted person/company from Helena.

Costs:
Potential savings in operation costs because the City of Helena has personnel who could check on the Helena city water intakes on a regular basis. If that individual would, on the same trip, also check the water and waste equipment of Rimini, considerable total manpower savings would be realized.

Assume three trips per week/ two hours /trip savings if accomplished by City of Helena employee in lieu of separate employee.

6 hrs X 52 wks X $20.00/hr = $6240 annually

	Local Resident	Helena Resident	Helena City Employee
3 inspections weekly	$6240/year	$6240/year	$6240/year
Management/Supervision	$1000/year	$1000/year	$0/year
Training for Accreditation	$12,200/52=$600/yr	$3000/52=$150/yr	$0/year
Rimini Training	Same for all	Same for all	Same for all
Weekly Travel Time	0	3 hr/wk x$20 = $3120/yr	0
Annual Cost	**$7,840**	**$10,510**	**$6,240**

Lowest cost option appears to be the Helena City Employee option

VALUE ENGINEERING RECOMMENDATION # 12

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Delete water meters at the individual services.

Creative Idea 82

ORIGINAL DESIGN:

Specification Section 15470, Meter Box and Flow Meters, paragraph 2.02 A, Flow Meter, states: "Provide Neptune Model T-10 residential cold water flow meter, or Engineer approved equal. Flow meter shall include signal wire, signal converter, and all components required to provide remote meter reading. Provide all required hardware to connect meters to pipe."

RECOMMENDED CHANGE:

Delete the requirement for the water meter. If customers are charged a 'flat rate', on a periodic basis (i.e. monthly), the need for the water meter installation disappears. Recommend however, that the requirement to install the meter box remain in the contract. Contract Drawing DW3, detail B, Water Service Line Connection, shows a Water Sampling Station and a Backflow Preventer installed within the box. The requirement to install these items should remain. A 'blank' ¾" line would be installed in place of the meter.

* Local utility and state requirements regarding installation of water meters at individual properties were investigated during the VE screening period. It appears that no regulation exists that would prevent this recommendation from being implemented.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$23,400		$23,400
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)	$23,400		$23,400

ADVANTAGES:

- Eliminates the time and cost of ordering, delivering and installing the meter.
- Encourages the use of treated water for all domestic activities.
- Eliminates the time and cost of regular meter readings.

DISADVANTAGES:

- Some minor revision to the contract drawings will be necessary.
- Discourages prudent use of water resources by homeowners.
- 'Buy-in' may be needed from the community ('water user' versus 'water saver' conflicts).
- System size reduction due to the fact that the existence of the irrigation line was taken into consideration during the design.
- Encourages use of treated water for irrigation.
- Eliminates equity with other city water users.

JUSTIFICATION:

The possibility exists that the residents of Rimini who are connected to the new water and sewer lines can be charged a flat (monthly) rate for the provided services. If this were the case, installation of the meters would be a meaningless and unnecessary activity. By installing the meter box, the availability exists to install meters in the future, if desired.
Assumed cost of water meters: $500.00/ea.
Assumed cost of plumber: $50/hr.

VALUE ENGINEERING RECOMMENDATION # 12

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Water meters	ea	500		25	$12,500.00	0	$0
Labor to install meters	hr	50.00		50	$2,500.00	0	$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
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					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$15,000.00		$0
Mark-up		@ 56 %			$8,400.00		$0
Redesign Costs							
Total					$23,400.00		$0

VALUE ENGINEERING RECOMMENDATION # 13

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use Pre-engineered well house versus Concrete Masonry Unit (CMU).

Creative Idea 88

ORIGINAL DESIGN:

The Draft Cost Estimate for the Community Water Supply includes a brief description of the proposed well house; "CMU building 16' X 16' on concrete foundation w/pump controls and arsenic removal equipment".

RECOMMENDED CHANGE:

Recommend replacing the CMU well house with a pre-engineered metal building.
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SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$78,000		$78,000
RECOMMENDED DESIGN	$39,000		$39,000
ESTIMATED SAVINGS OR (COST)	$39,000		$39,000

ADVANTAGES:

- Reduced cost for materials and installation.
- Functionality of the building remains the same.
- Reduced transportation of building materials and equipment.
- Suppliers are readily available.
- Foundation construction will be easier.

DISADVANTAGES:

- Lead time may be required when ordering.
- Steel building may be more susceptible to vandalism.
- Building life may be less than CMU.

JUSTIFICATION:

The functionality of the building will not change; building dimensions and floor space will be equal. The site preparation requirements will be similar but the foundation requirements, materials and installation costs will be reduced.
Cost savings could approach $40,000.

VALUE ENGINEERING RECOMMENDATION # 13

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Proposed CMU building.	LS	50,000.		1	50,000.00	0	$0
Alternate pre-engineered structure.	LS	25,000		0	$0.00	1	$25,000.00
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
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					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$50,000.00		$25,000.00
Mark-up		@ 56 %			$28,000.00		$14,000.00
Redesign Costs							
Total					$78,000.00		$39,000.00

VALUE ENGINEERING RECOMMENDATION # 14

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Install a temporary intake structure for the Helena city water supply downstream of the Rimini utility work and connect to the 18-inch Helena water supply line, allowing work to occur with that section of line upstream of the temporary intake empty. This could be combined with Recommendation 2.

Creative Idea 91

ORIGINAL DESIGN:

18-inch concrete pipeline is removed, a 16-inch temporary bypass line is installed, a new 18-inch diameter Helena raw water line is installed in Rimini Road.

RECOMMENDED CHANGE:

Install a temporary impoundment using 50 feet of 15 feet high sheet pile anchored in a trench (using boulders and rocks excavated from the site) with a temporary control box fashioned from a 6' diameter precast manhole equipped with a slide gate at the inlet and shut off valve at the discharge. Approximately 100 LF of 16" HDPE pipe will be used to connect to an existing manhole across Rimini Road. A new shut off valve will be needed at the existing outlet structure to fully shut off flow from the 18-inch concrete supply line during utility construction.

An alternative is to leave the existing 18-inch line in service and use this recommended temporary impoundment as a standby in case the 18-inch pipeline is accidentally damaged.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	0		
RECOMMENDED DESIGN	$110,281		$110,281
ESTIMATED (COST)	($110,281)		($110,281)

VALUE ENGINEERING RECOMMENDATION # 14

ADVANTAGES:

- Provides for the uninterrupted water supply to the city while utility work proceeds adjacent to the water line upstream.
- Increases production rates, allowing work to be completed sooner.
- Improves relations with the city of Helena.
- This could potentially serve as an alternative raw water supply for the City of Helena.

DISADVANTAGES:

- Short term environmental impacts to the Upper Tenmile Creek when installing and removing the temporary intake structure/dam.
- Aesthetically unattractive.
- A road crossing will require traffic interruptions.

JUSTIFICATION:

A temporary intake structure for the Helena city water supply downstream of the Rimini utility work will allow work to be done with that section of the existing 18-inch raw water line empty. This will eliminate the concern with interrupting the water supply to Helena.

As an alternate, keep the existing 18-inch line in service and use this temporary impoundment only in an emergency. While this recommendation has a cost of $110,000, the cost of the 18-inch line replacement and a temporary 16-inch bypass line has a cost of nearly $1.2 million (see the cost breakdown in Recommendation number 2). Consideration should be given to accepting this recommendation in concert with Recommendation number 2.

VALUE ENGINEERING RECOMMENDATION # 14

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
Excavate trench Install sheet pile	sf	$20	Means		$0	750	$15,000
Anchor with Rock (onsite borrow source)	ls				$0	1	$5,000
6'dia x 10' precast conc MH steps/frame & cover	ea				$0	1	$4,800
Flanged wall sleeve	ea				$0	2	$500
16" Slide Gate	ea				$0	1	$2,500
16" Plug Valve	ea				$0	1	$4,000
16" HDPE	lf	$44			$0	100	$4,400
Trench Exc/BF	lf	$12.50			$0	100	$1,250
Cut into existing MH	ea				$0	1	$1,000
Demo all the above/scrap	ls				$0	1	$5,000
Remove existing 16" valve at intake	ls				$0	1	$5,000
Install new 16" valve	ls				$0	1	$4,900
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Cost					$0		$53,500
Contingencies	25%				$0		$13,337
					$0		$66,837
Mark-up	50%	@			$0		$33,418
Subtotal					$0		$100,256
Redesign Costs	10%						$10,025
Total					$0		$110,281

SECTION 4 – DESIGN COMMENTS

ID # CMT #	Design Comment / Description
4	**LOOK AT ALTERNATIVE MATERIALS TO COPPER FOR SERVICE LINES.** Copper piping is likely a more expensive alternative to other materials that may be available for the relatively small diameter service lines (< 1" dia) to the users. Alternatives that could be considered are Acrylonitrile-butadiene-styrene (ABS) Plastic Piping, polyethylene, and PVC. Materials with some flexibility will be resistant to punctures that might occur during installation in rocky areas.
8	**SCREEN SOIL FOR OVERSIZED MATERIAL AT THE EXCAVATION LOCATION.** Significant quantities of material will need to be excavated from the road during utility installation. Utilizing a screening plant which follows along behind the excavation can be direct loaded by the excavator as the excavation proceeds. The screen should fit within the road lane already closed and should be able to be pushed along with the excavator as the excavation proceeds. Some material may spill over but that material could be easily kept up with by the loader supporting the operation and backfilling the excavation. Maximum diameter will be a function of how close to the utility pipe the soil is to be used. Using the screen in close proximity of the excavation would eliminate a separate staging area and the need to multi-handle the soils between the excavation location and the screening location. The need for one or two 10-wheel trucks to haul the material to be screened would also be eliminated. Having the screen behind the excavator would require a complete ½ swing by the excavator to load the screen and that would increase cycle times over the time required to load a truck in the adjacent lane.
9	**USE PRECAST APRON FOR THE INSTALLATION OF THE SEWER MANHOLES.** The Sewer manholes are installed in the sub grade in the road to allow for road maintenance grading. Concrete aprons are poured sloping away from the lip of the manhole to deflect any grader blade that may get deep enough to reach the top of the structure. The aprons are typically framed in place with rebar wired for strength. Given the need to keep the road open to the extent possible it would be beneficial to have precast aprons which could be placed around the manhole and grouted in place. That would reduce the time the excavation needs to remain open to facilitate frame up of the structure in place and set up time for the concrete. Pouring the apron in place allows the slope to better match the crown of the road, however, since the manholes tops are supposed to be a min 1 ft below grade the small difference in crown should not affect the apron.
10	**RECOMMEND THE CONTRACTOR BE REQUIRED TO PUT TOGETHER A DEWATERING PLAN FOR REVIEW AND APPROVAL.** This would ensure dewatering is accomplished efficiently and minimizes disruptions with other portions of the work.
19, 80	**LEAVE LARGE ROCKS AND BOULDERS ONSITE. REVIEW RIPRAP SPECIFICATION 02551, TO ALLOW USE OF LOCAL MATERIALS WHERE APPROPRIATE.** Specification 02111, section 3.04.A.2, page 02111-7, requires that the contractor decontaminate, transport and stockpile large uncrushed stones and

ID # CMT #	Design Comment / Description
	boulders offsite at an approved disposal location. Specification 02551, section 1.01.A requires that the contractor furnish all materials required to install riprap protection at locations indicated on the Contract Drawings. The specification also requires that riprap materials are required to meet riprap requirements noted in Montana Department of Transportation (MDOT) Standard Specifications for Road and Bridge Construction. Consider deleting or changing the specification 02111 requirements noted above to allow the contractor the option to leave the large rocks and boulders onsite at a location to be identified either by EPA, or to be identified by the contractor. Consider changing the specification 02111 requirements noted above to allow the contractor to sell these boulders and/or crush and reuse the rocks for riprap or other purposes once they are decontaminated. Such a change would be consistent with specification 02111, section 1.01.A, which currently allows the contractor to reuse crushed boulders onsite after decontamination. Also, once remedial action funding is assured for this project, EPA and/or the State may consider conducting various activities which may lessen the overall cost of the RA, including: a) develop an agreement with the County to purchase and remove all or some portion of decontaminated boulders; and/or b) arrange for/lease/potentially purchase a lot within Rimini where large rocks and boulders can be stored temporarily or placed permanently. If such activities result in agreements, consider changing the specification 02111 requirements noted above to be consistent with the results of these activities. In addition, consider changing the specification 02551 requirements noted above to note that the contractor may decontaminate, crush and use large rocks and boulders that are encountered onsite during construction activities for riprap.
22	**REDUCE EXCAVATION SIDESLOPE REQUIREMENTS.** The requirement to slope the excavation sides is contained in specification section 02111, ROAD EXCAVATION, STOCKPILING AND SCREENING OF MATERIALS, Paragraph 3.01 D: "The maximum allowable slope for excavations greater than 4 feet deep shall be 3 horizontal to 1 vertical (3H : 1V) except as approved by the engineer." This statement seems to recognize the fact that there are instances where a relaxation of the 3H : 1V side slope standard may be warranted. The determination as to the stability of the excavation side slopes must be made by a qualified person. The angle of the slope needed to prevent cave-in is a function of the soil type, environmental factors such as moisture and freezing weather, and the magnitude and location of any loads and vibration surcharged upon the slopes.
25	**DO NOT REQUIRE STRUCTURAL FILL FOR DRIVEWAYS AND ROADWAYS.** It appears that driveways will be rebuilt with crushed base course, graded and compacted and topped with crushed surface topping rock, graded and compacted. This will produce a driveway that far exceeds most existing drives. Consider reducing requirements.
33	**USE OF ALTERNATIVE CONTRACTING STRATEGIES TIME&MATERIAL VERSUS INVITATION FOR BID (IFB).**

ID # CMT #	Design Comment / Description
	The work accomplished to date has been done using fixed bid contracting. Because of the uncertainties with variations in estimated quantities, the unknown work underground, consideration could be given to using other than fixed price, bid item contracts. Other options are cost reimbursable fixed fee contracts, time and material contracts or a number of other methods. By expanding the type of contracting, more contractors may be interested, the ease of managing the contractors is simplified, and both contractor and the government can benefit.
40	**ABANDON RESIDENTIAL WELLS POSING A POTENTIAL DERMAL THREAT.** Existing wells in Rimini with extreme arsenic concentrations have recently been identified as posing a potential dermal exposure threat. Leaving these high arsenic concentration water sources available could pose a threat to young children.
43	**REDUCE THE SANITARY SEWER DEPTH.** Reassess the depth of the sanitary sewers, especially in long runs between locations where house connections intercept the mains. Several lengths of piping have slopes that make the piping deeper than needed, for instance Sta 150+00 to 147+00, station 144+00 to 138+00, 131+50 to 116+32.
46	**REDUCE THE NUMBER OF MANHOLES**. Given minimal deflection in the sewer line, it would appear feasible to use the standard deflection in the piping to make small curves in the line allowing the elimination of several manholes, which could reduce costs significantly. Examples CMR 8 or 9, CMR 12, 15 & 17, CMRS 24, CMRS 27 or 28, and CMR 31.
55	**CONTRACTOR SHOULD BE ABLE TO DOUBLE UP ON DUTIES (E.G., DO NOT HIRE FLAGMEN; DEPEND ON SIGNAGE AND HEALTH AND SAFETY PERSONS/LABORERS TO PERFORM THOSE FUNCTIONS).** Various health and safety-related specifications require costly on-site presence during all construction activities, and such requirements may not be necessary to assure protection of human health or the environment. For example, specification 01010, Section 1.05.C, requires that flaggers be present at all times at all locations where public traffic and construction traffic will be sharing the road or construction traffic is entering the public road. Since road traffic is infrequent in Rimini, consider allowing the contractor to use signs to warn passersby or potential traffic of ongoing construction activities wherever public traffic and construction traffic will be sharing the road or construction traffic is entering the public road. Also, consider requiring the contractor to train onsite laborers who will be performing ongoing construction activities to enable these workers to appropriately direct traffic around ongoing construction activities. Also, specification 01351, section 1.01C.1, requires all contractor employees and/or subcontractors working onsite with the contractor to be trained and updated under the 40 hour OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training program. Such a requirement may not be necessary to assure protection of human health if those workers are working in 'clean zone' areas where construction may be occurring as part of the remedy.
56, 57	**REQUIRE 40 HR TRAINING (OR 24 HR TRAINING) ONLY FOR WORKERS WHO ARE AT RISK OF EXPOSURE OR POTENTIAL RISK TO**

ID # CMT #	Design Comment / Description
	CONTAMINANTS. Portions of the utilities work associated with bringing water to the site from the new source area, construction of the treatment systems for both potable water and sewer, and construction of service connections in remediated yards will not result in exposure to hazardous materials or work in proximity to removal operations. Removing any requirement for 40 hr training for those persons would expand the available labor pool for completion of those tasks. Expanded subcontractor options may result in more competition and lower costs. More available contractors may also, depending on scheduling by the prime, reduce the time required for construction and associated oversight costs. 1926.65 says the HAZWOPR 40 hr training "covers the following operations, unless the employer can demonstrate that the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards: Clean-up operations required by a governmental body, whether Federal, state, local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites..." It's still a site where remediation work will be occurring, even if there is clean cover and sealed wells. The OSHA standard says that 24-hour training is appropriate for workers on site occasionally for a specific limited task and are unlikely to be exposed over a PEL. Twenty-four hour training is also appropriate for workers regularly on site who work in areas that have been monitored and fully characterized and exposures are under the PEL.
60	**INCLUDE DUST CONTROL AS A UNIT PRICE ITEM IN THE IFB.** The dust control costs shown in the estimate appear very high at $459,374 or 6 percent of the total contract cost. The direct material cost for dust control is about $5,000 with the remaining cost in labor, equipment and markups. Dust control is important, but the costs should be reviewed. This cost does not include cost for road maintenance during construction at another 12 %.
63	**CLARIFY THE COMPACTION REQUIREMENT IDENTIFIED IN SECTION 01800 MAINTENANCE AND DUST CONTROL.** The compaction required in Section 3.02.B and D. are most likely related to Magnesium Chloride applied to roads being repaired but is somewhat confusing being addressed in a section concerning Magnesium Chloride Application.
66	**DO NOT USE VARIATION IN ESTIMATED QUANTITIES CLAUSE IN CONSTRUCTION CONTRACT.** Typical construction contracts that have unit pricing include a "variation in estimated quantities clause". This clause allows either the owner or the contract to request a different price for quantities that exceed the variation clause that is plus or minus 15 to 25 percent. Restated, if an estimated quality is 100 units, and the field conditions require 200 units be installed, either party to the contract can request a new price on the last 85 units. Whether under or over, the contractor usually requests additional payment and will state plausible reasons for the additional costs. For this contract, one unit that is more difficult to compute may be the quality of contaminated material that needs to be removed and hauled. In lieu of the variation in estimated quantities clause, two unit prices for this work could be bid. Using the above example, have a base unit of 75 items. The contractor is guaranteed

ID # CMT #	Design Comment / Description
	these 75 units regardless of field conditions. The next unit would be 25 items, but without the variations clause enacted. (The variations clause would be excluded from this unit.) The unit cost would be fixed by the contractors bid. This simplifies the contract administration for both the owner and the contractor. The contractor will put all known costs, mobilization and demobilization, etc., into the first unit. A change order would not be needed unless the amount of the unit exceeds the "scope of the work".
67	**PUT A PERCENTAGE CAP ON THE GENERAL CONDITIONS.** The current estimate has a cost for "general conditions" of 14 percent. Additionally, there is 11 percent for "general site work". It is assumed that the majority of the remaining contract pricing will be unit pricing with a stated estimated unit quantity. General conditions include many items such as trailers, mobilization, demob., superintendents, quality control, testing, temporary toilets, safety, signs, etc. Contractors tend to put as much cost into general conditions as possible because they can get paid up front for these costs. By limiting the percentage on the general conditions, the contractors have to include the costs into the unit price items, where many of these costs belong. Suggest the general conditions maximum percentage be set at 12 to 14 percent.
68	**RECOMMEND THE ITEMS INCLUDED IN THE GENERAL CONDITIONS (GC's) BE REVIEWED.** It appears several of the items presently in the GC's could be removed and put in as unit priced items
71	**HOLD THE PREBID SITE VISIT IN THE FALL OF THE PREVIOUS YEAR.** The fall time frame includes 20 September to 20 December. The funding for the Government contracting officer to host such an event would be problematic for the month of October and the first two weeks of November. After mid November, the site would be covered in snow which would compromise the effectiveness of the job walk but not render it useless.
73	**SANITARY SEWER/WATER PERFORMANCE TESTING REQUIRED BY SPEC NUMBER 02730 TO THE MDEQ CIRCULAR DEQ–2 REQUIRES DEFLECTION TESTING, LEAKAGE TESTING, FOR SEWERS AND LEAK TESTING OF MANHOLES.** Consider reducing the amount of testing to be consistent with the relatively straight forward sewer collection construction being accomplished at the site.
74	**CONSIDER COMBINING CONTRACTOR WORKPLANS.** Where appropriate, consider adjusting/revising Specification 01300 (Submittals), 01025, section 3.01.C, and/or potentially other specifications which require plans to allow the contractor to combine various work plans that are separately required in the specifications into one or several work plans. Such an adjustment may potentially reduce schedule and costs because the government could potentially reduce the overall time required to review multiple documents, and potentially reduce construction downtime for development and review of separate documents. The specifications require the contractor to submit various plans noted below (other plans may also be required but are not noted below). Several of these plans could potentially be combined into one plan (e.g., a,d&f; b,c,e,g,&h): a) Construction Management Plan to the requirements of SECTION 01170 –

ID # CMT #	Design Comment / Description
	SPECIAL PROJECT PROVISIONS; b) Environmental Protection Plan to the requirements of SECTION 01490 – ENVIRONMENTAL PROTECTION; c) Community of Rimini Traffic Control Plan to the requirements of SECTION 01470 – ACCESS AND TRAFFIC CONTROL. d) Construction schedules in accordance with SECTION 01310 – PROJECT SCHEDULE e) Site Safety and Health Plan in accordance with SECTION 01351 – SAFETY, HEALTH, AND EMERGENCY RESPONSE f) Contractor Quality Control Plan in accordance with SECTION 01440 – CONTRACTOR QUALITY CONTROL g) Waste Management and Disposal Plan in accordance with SECTION 02111 – ROAD EXCAVATION, STOCKPILING, AND SCREENING OF MATERIALS and SECTION 02112 – EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. h) QA/QC procedures for air sampling, in accordance with Specification 01775 i) Dewatering plan in accordance with Specification 02140 j) Herbicide Treatment Plan, in accordance with Specification 02925
75	**DRAFT SYSTEMS OPERATION PLAN SHOULD BE PREPARED PRIOR TO STARTUP**. The contractor or contractor AE should develop a Systems operating plan that lays out the process the operator and/or operating contractor will use to bring the system on line and do the appropriate shake down prior to starting up the system. The plan should include a "first cut" of the O&M plan to be used by the operator and operations contractor as a template, and periodically update the overall system O& M plan during the shake-down/commissioning period. When the initial operations contractor has completed the initial startup phase, the System Operations Manual should be used as a basis for training the new operator(s)**.**
76	**PROVIDE STARTUP TRAINING TO THE WATER AND SEWER BOARD AS PART OF THE INITIAL O&M.** The specifications for water and wastewater treatment plant operation and maintenance should note that EPA's contractor, who will manage the water and wastewater treatment systems during the operational and functional 'shakedown' period, should train the state or local water board staff who will be conducting plant operation and maintenance when EPA transfers the treatment systems to the State or local water board for their operation and maintenance of the treatment plants. EPA's guidance on "Transfer of Long-Term Response Action (LTRA) Projects to States" (July 2003) notes in Section D, page 5, that during the Remedial Action stage, EPA should encourage State officials to visit the site, and provide adequate time for the State to prepare for transfer of LTRA projects to the State. (see http://www.epa.gov/superfund/action/postconstruction/ltrafactsheet.pdf) The guidance notes that EPA should provide transition assistance to the State to allow State staff to receive training on plant operation and maintenance. Exhibit 3 of this guidance, page 7, notes that EPA should ensure that the RA statement

ID # CMT #	Design Comment / Description
	of work and design specifications require training of State or local water board O&M staff before the remedy is turned over. This exhibit also notes that during the last year of RA for LTRA projects, during which EPA is operating the treatment system, EPA should assure that State personnel or contractors observe operations and receive training on the treatment system. The guidance also notes on page 8 that during this year, the State should have completed its contracting activities and have its contractor in place to observe and receive training on the system, in order to facilitate transition of the system from EPA to the State. The guidance also notes that EPA and the State may jointly operate the system for the final month(s) of EPA's operation of the treatment systems before final transition to the State, when O&M begins.
78	**ESTABLISH WHEN RIMINI TAKES OWNERSHIP**. The specifications for operation and maintenance of the remedy (section 01730, and/or other specifications which discuss O&M of particular components of the remedy) should clarify that the State and/or the local water board will take ownership of the various components of the remedy when those components are determined concurrently by EPA and the State to be operational and functional (O&F). At this time, the State and/or the local water board will take over O&M of all remedial components, which require O&M (e.g., all treatment plants, water/wastewater conveyance systems, soil cover, etc.). EPA's Superfund Regulation (National Contingency Plan, NCP,) guidelines, at 40 CFR Part 300.435(f)(3)), note that ground or surface water measures initiated for the primary purpose of providing a drinking water supply, not for the purpose of restoring ground water, and all other non-groundwater restoration activities and remedial components, would be eligible for up to one year of EPA cost-share, until the remedy is operational and functional. During the O&F period, for Fund Lead sites, EPA pays 90 percent of the action and the State funds 10 percent (unless the State owned or operated the site, in which case the State funds 50 percent of the action). The NCP notes that for Fund-financed remedial actions, the lead and support agencies should conduct a joint inspection at the conclusion of construction of the remedial action and concur through a joint memorandum that: (1) the remedy has been constructed in accordance with the ROD and with the remedial design, and (2) the start-up period should begin. At the end of the start-up period, the construction contractor or agency will prepare a remedial action report that the work was performed within desired specifications and is operational and functional. The lead and support agencies will then conduct a joint inspection in order to determine whether to accept the remedial action report, and upon acceptance of that report, O&M begins. EPA's "Operation and Maintenance in the Superfund Program" (cited below) notes that a schedule for the transition to the O&M period should be developed as part of the O&M Plan developed during RD and refined during the RA. This schedule should include adequate time for a State to arrange for O&M. Additional details on how ownership of a Superfund remedy should transfer to the

ID # CMT #	Design Comment / Description
	state, including paperwork and inspection requirements, are noted in: a) EPA's guidance on "Transfer of Long-Term Response Action (LTRA) Projects to States" (July 2003), available at http://www.epa.gov/superfund/action/postconstruction/ltrafactsheet.pdf. b) EPA's "Superfund Post Construction Completion: An Overview" guidance, available at http://www.epa.gov/superfund/action/postconstruction/pcc_over.pdf. c) EPA's "Closeout Procedures for National Priorities List Sites" (January 2000) OSWER 9320.2-09A-P, EPA 540-R-98-016, available at http://www.epa.gov/superfund/resources/closeout/index.htm. EPA's "Remedial Design/Remedial Action Handbook" (June 1995), available at http://www.epa.gov/superfund/whatissf/sfproces/rdrabook.htm.
79	**CAN SWD CHARGE FEES TO RIMINI RESIDENTS WHILE UNDER THE ONE-YEAR STARTUP PERIOD?** EPA's Superfund Regulation (National Contingency Plan, NCP) guidelines, at 40 CFR Part 300.435(f)(3)), note that ground or surface water measures initiated for the primary purpose of providing a drinking water supply, not for the purpose of restoring ground water, and all other non-groundwater restoration activities and remedial components, would be eligible for up to one year of EPA cost-share, until the remedy is operational and functional (O&F). During the O&F period, for Fund Lead sites, EPA pays 90 percent of the action and the State funds 10 percent (unless the State owned or operated the site, in which case the State funds 50 percent of the action). EPA's available guidance which discusses O&F determinations does not discuss whether a water or sewer district could charge fees to residences during O&F periods. EPA Headquarters staff who serve as contacts for O&F determinations, and who conduct training on this topic, are not aware of situations where residents who are receiving water or sewer services during the O&F period of a Superfund remedy have been charged fees for such services during the O&F period. Guidance on O&F is provided in the following: d) EPA's guidance on "Transfer of Long-Term Response Action (LTRA) Projects to States" (July 2003), available at http://www.epa.gov/superfund/action/postconstruction/ltrafactsheet.pdf. e) EPA's "Superfund Post Construction Completion: An Overview" guidance, available at http://www.epa.gov/superfund/action/postconstruction/pcc_over.pdf. f) EPA's "Closeout Procedures for National Priorities List Sites" (January 2000) OSWER 9320.2-09A-P, EPA 540-R-98-016, available at http://www.epa.gov/superfund/resources/closeout/index.htm. EPA's "Remedial Design/Remedial Action Handbook" (June 1995), available at http://www.epa.gov/superfund/whatissf/sfproces/rdrabook.htm**.**
85	**UPSIZE POTABLE WATER LINE TO 6 INCH AND ADD FIRE HYDRANTS IF ADDED FUNDING IS PROVIDED BY THE RURAL FIRE DISTRICT.**

ID # CMT #	Design Comment / Description
	There currently are only minimal fire hydrants for use in the rural community of Rimini. The new proposed domestic water line will be sized at four inches. This size is based on the usage capacity for domestic water. Fire water lines require a six-inch line for installation of fire hydrants on the line. The difference in cost between a four inch and six inch line is minimal. The installation cost is approximately the same. If the community or fire district or Water and Sewer Broad could pay the difference in cost between the four and six inch line and several fire hydrants, the community would have the benefits of hydrants at a very reasonable cost. Some additional engineering regarding total capacity, recharge time, etc. would be needed prior to implementation. This cannot be done until the exact water source is determined. But the concept could be presented to the community for general acceptance or rejection. An order of magnitude for line size increase and two fire hydrants is roughly $5,000.
86	**THERMAL INSULATION AND HEATING FOR WATER STORAGE TANK.** The designers may want to evaluate whether insulation and/or heating with either solar cells or conventional gas or electric systems would be a cost effective alternative to partial burial (~3/4). However, any means other than solar heating should be evaluated in terms of the required long-term costs that could eventually be higher than the earthwork costs to bury the tank.
87	**ADD A WATER TANK SPECIFICATION TO THE DESIGN**
89	**LOOK FOR USED GENERATORS.** Consider looking on used equipment web sites for excessed government equipment such as the generators. Typically items such as generators are well maintained and almost never used. The GSA Web Site is http://www.gsa.gov/Portal/gsa/ep/channelView.do?pageTypeId=8211&channelPage=%2Fep%2Fchannel%2FgsaOverview.jsp&channelId=-13014

APPENDICES

The appendices in this report contain backup information supporting the body of the report, and the mechanics of the workshop. The following appendices are included.

CONTENTS

APPENDIX A
STUDY PARTICIPANTS

STUDY PARTICIPANTS

Workshop Attendance

Attendees

Upper Tenmile -Rimini Value Engineering Study 17-19 April 2007

Name	Organization and Address (Organization first, with complete address underneath)	Tel # and FAX. (Tel first with FAX underneath)	Role in wk shop	Participation: Meetings: Site Visit 17 A	Mid Wk Rev	Out Brief 19 A	Study Sessions: Day 1 17 A	Day 2 18 A	Day 3 19A
Kenneth True	VE Contractor kentrue@maladon.com	402-339-1936 C 402-516-2635	Team Facilitator	X		X	X	X	X
Tim Gallagher	USACE, Baltimore District Tim.gallagher@nab02.usace.army.mil	484-356-4312	CE, Construction	X		X	X	X	X
Curtis Payton	USACE, Sacramento District Curtis.payton@usace.army.mil	916-557-7431	Geologist	X		X	X	X	X
Ed Hanlon	USEPA, HQ Hanlon.edward@epa.gov	703-603-9069	Team Member	X		X	X	X	X
Lindsey Lien	USACE, HTRW CX Lindsey.k.lien@usace.army.mil	402-697-2580	VE Project Coordinator	X		X	X	X	X
Mike Bishop	USEPA, Region 8, Helena MT. Bishop.mike@epa.gov	406-457-5041	RPM	X		X	X	X	X
Neil Marsh	CDM marshna@cdm.com	406-441-1403	RD Designer	X		X	X	X	X
John Hartley	USACE, Omaha, Rapid Response. John.r.hartley@usace.army.mil	402-216-4248 Geochemist	Rapid Resp.,Site Characterization	X		X	X	X	X
Dave Swanson	CDM swansonda@cdm.com	406-441-1433	RA, Project Manager			X		X	
John Wardell	USEPA, Region 8	406-457-5001 Montana Office Director				X			
Vic Andersen	Montana Department of Environmental Quality	406-841-5025	State Repress.			X			

Attendees Role in this workshop (column 4 of the form). Use more than one description if appropriate.

C = Consultant Cl = Client DM = Design Manager FM = Facility Manager FO = Facility Operator D = Designer
Ob = Observer Ow = Owner PM = Project Manager PrM = Program Manager TM = Team Member U = User

Note: X = Present most of the day. O = Present part of the day Blank = not present that day

APPENDIX B
CREATIVE IDEAS LIST

List of CREATIVE IDEAS			
Idea Category: Upper Tenmile – Rimini (4/18/2007) **R=Recommendation D=Design Comment E=Eliminate W=Withdrawn**			
ID #	**Name of Idea / description**	**Value Potential**	
1	Don't install new 8" sewer line and septic system	E	
2	Just install sewer line with stub outs-service connections by home owner	E	
3	Do all service connections by cost reimbursable contract	R	
4	Look at alternative materials to copper for service lines	D	
5	Don't install water distribution-use POU/POE	E	
6	Do not install water service lines-just curb stop	W	
7	Use stabilized soil material for road backfill	W	
8	Screen soils for oversize at the excavation	D	
9	Use precast apron around the manhole lids (or preassembled reinforcing cages for cast in place)	D	
10	Dewatering preplanning (use new sewer line) Need submittal-dewater in advance of work	D	
11	Don't dewater pipe trenches	E	
12	Connect to Helena Wastewater Treatment works	E	
13	Use wastewater holding tank for pump-out by WSD	W	
14	Install evaporation lagoon	W	
15	Add aeration to lagoon	W	
16	Eliminate 3000 LF of Replacement 18" Helena Raw Water Line, and Rimini irrigation line	R	
17	Eliminate temporary 16" bypass waterline (Combine w/16)	R	
18	Do not excavate in or around septic systems	E	
19	Leave large rocks and boulders on site (spec rqm't)	D	
20	Crush or otherwise reuse large rocks (backfill)	E	
21	Screen out oversize from contaminated stockpile	R	
22	Reduce excavation side slope requirement	D	
23	Do not require select fill for yards	E	

List of CREATIVE IDEAS			
Idea Category: Upper Tenmile – Rimini (4/18/2007) **R=Recommendation D=Design Comment E=Eliminate W=Withdrawn**			
ID #	**Name of Idea / description**	**Value Potential**	
24	Use Rimini Alluvium for the water supply	W	
25	Do not require structural fill for driveways and roadways	D	
26	Install water lines above ground	E	
27	Truck in potable water	E	
28	Pave road versus excavate road	E	
29	Don't excavate mine waste below water table in staging areas and yards	E	
30	Evaluate surface water versus well water for water supply capital versus O&M or combination (include treatment)	R	
31	Use cisterns and snow melt for a water supply	E	
32	Use individual cisterns for home owners	E	
33	Use of alternative contracting strategies T&M versus IFB	D	
34	Look at alternative piping materials for the transmission line between the Ruby Creek well and polyethylene (zaplock)	R	
35	Don't replace damaged septic systems to meet new requirements	E	
36	Use vacuum extraction in lieu of traditional methods	R	
37	Buy out/relocate homeowners and do a modified RA	E	
38	Add hydropower generation to Tenmile creek	E	
39	Limit excavation to 12 – 18" for yard areas	E	
40	Abandon residential wells posing a potential dermal threat	D	
41	Require abandonment of all current wells IAW state requirements	W	
42	Provide only potable water to residences reducing the system capacity requirements from 32 gpm to ~20 gpm	E	
43	Reduce the sanitary sewer depth	D	
44	Abandon the septic altogether and use the septic tank as potable water storage, use groundwater surrounding tank as source of water, treat as appropriate	E	
45	Look at clusters of homes on a separate septic systems	E	
46	Reduce number of manholes	D	

List of CREATIVE IDEAS			
Idea Category: Upper Tenmile – Rimini (4/18/2007) **R=Recommendation D=Design Comment E=Eliminate W=Withdrawn**			
ID #	**Name of Idea / description**	**Value Potential**	
47	Revise water and sewer line alignments due to leaving the existing 18" Helena raw water line in place	R	
48	Combine sewer line services from 2 or more properties in one line to the main lines	R	
49	Combine water services from 2 or more properties in one line to the main lines	R	
50	Mandate all properties connect to the new services Rimini Water and Sewer District	E	
51	Mandate access to all properties for work RWSD	E	
52	Mandate permanent easements for utilities RWSD	E	
53	Relocate the water storage tank and treatment works in the town and pump the water to the residents	E	
54	Provide single trench for sewer and water, use double walled pipe for water or pressure pipe for both sewer and water	E	
55	Contractor should be able to double up on duties e.g. not hiring flagmen, and depend on signage and H&S person/laborers to perform those functions	D	
56	Require 40 hour training only for those items that require it	D	
57	Is 40 hour training even required (combine w/#56)	D	
58	Insulate new water supply/transmission line between Ruby Creek and the Tank to facilitate shallower depth of burial	R	
59	Use larger pipe and use it as storage instead of 50,000 gallon tank	W	
60	Include dust control as a unit price item in the IFB Bid Form	D	
61	Place power lines in the same trench as the water transmission line (Ruby Creek to Power Source) by this contract versus having the utility company (NW Energy)	R	
62	Put in conduits and pull boxes for the utility company under this contract	R	
63	Delete requirement for compaction that is required by spec section 01800-1&3 Mag chloride	D	
64	Take water from 3 mine adits, treat it and provide it to the community for drinking water	E	
65	Make existing in-place system adit discharge operable	E	

	List of CREATIVE IDEAS		
	Idea Category: Upper Tenmile – Rimini (4/18/2007) R=Recommendation D=Design Comment E=Eliminate W=Withdrawn		
ID #	**Name of Idea / description**	**Value Potential**	
66	Take out variability of quantities clause	D	
67	Put a percentage cap on the general conditions	D	
68	Identify items that should be pulled from the contract general conditions and put in unit prices	D	
69	Can the period of performance be relaxed?	E	
70	Can funding be made available as identified in the project schedule (refine project schedule)?	E	
71	Can the prebid site visit be held in the fall of the previous year	D	
72	Evaluate rent versus buy options (and depreciate?)	E	
73	Sanitary sewer/water performance testing – reduce amount of testing	D	
74	Look at combining contractor work plans	D	
75	Draft System Operation Plan should be prepared prior to startup	D	
76	Provide startup training to the Water and Sewer Board as part of the initial O&M	D	
77	Hire Helena city workers to operate these systems	R	
78	Establish when Rimini takes ownership	D	
79	Can WSD charge fees to Rimini Residents while under 1 year startup	D	
80	Look at Rip Rap Spec, 02551 allow use of local materials where appropriate	D	
81	Use alternate materials for the water/sewer mains	E	
82	Delete water meters at the individual services	R	
83	Delete project meter (at water supply)	E	
84	Dry fire hydrant at Tenmile Intake Structure	E	
85	Upsize potable line to 6” and add fire hydrants if added funding is provided by the rural fire district	D	
86	Thermal insulation and heating for water storage tank	D	
87	Add Water Tank Spec	D	
88	Pre engineered well house versus CMU	R	

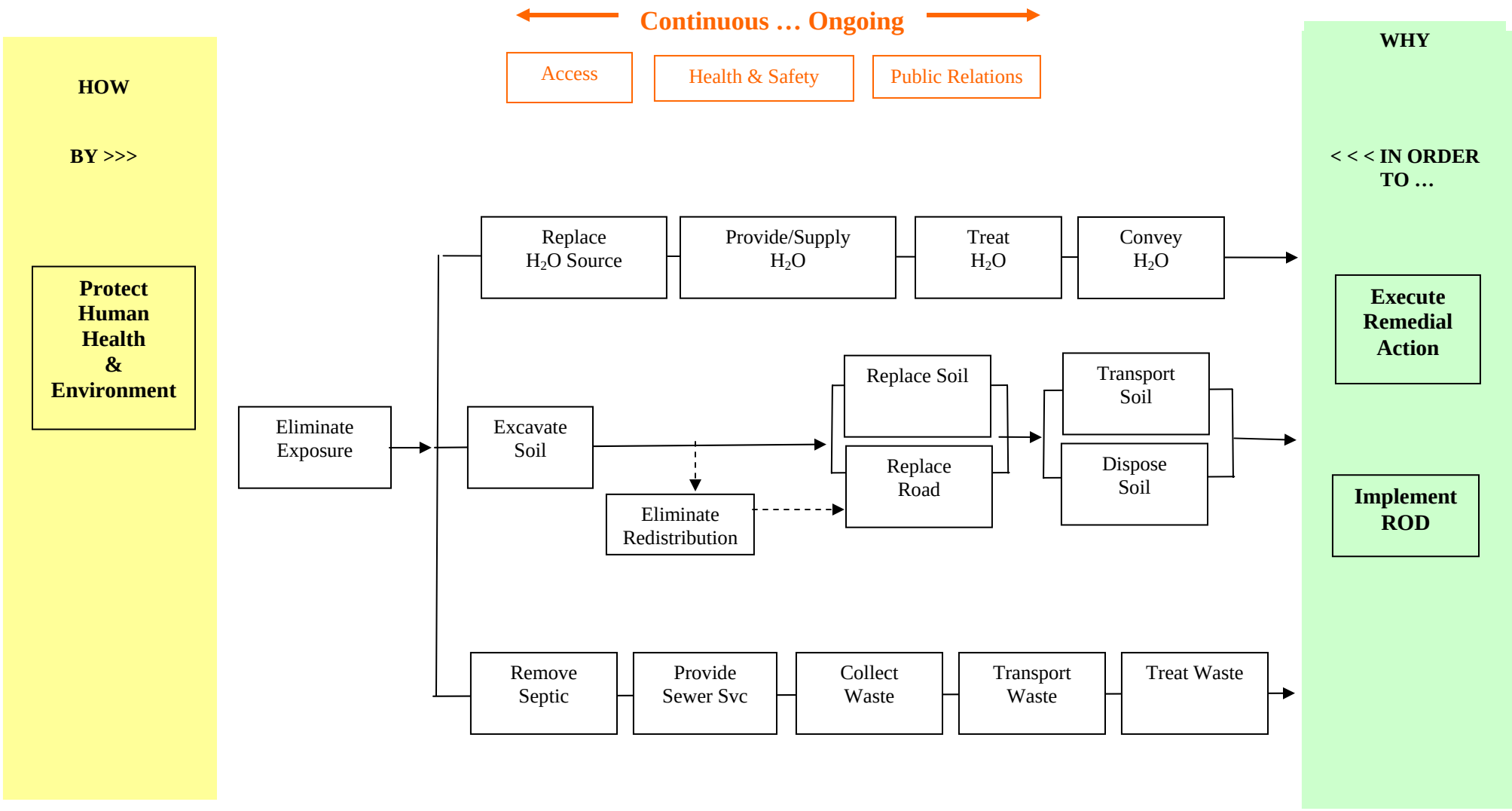
	List of CREATIVE IDEAS		
	Idea Category: Upper Tenmile – Rimini (4/18/2007) **R=Recommendation D=Design Comment E=Eliminate W=Withdrawn**		
ID #	**Name of Idea / description**	**Value Potential**	
89	Look for used generators	D	
90	Look at a single generator for both sewer and water	E	
91	Provide a temporary water intake for Helena Raw Water	R	

APPENDIX C
FUNCTION ANALYSIS SYSTEM TECHNIQUE (FAST) DIAGRAM

Function Model

Tenmile, Rimini Superfund Site
Helena, Montana

Item	**Function**
Excavate Soil	Remove COC
Transport Soil	Relocate COC
Dispose Soil	Store COC
Replace Water Source	Provide Clean Water
Treat Water	Treat Water
Water Piping	Convey Water
Remove Septic Tanks	Remove COC
Waste Water Treatment	Treat Waste
Waste Piping	Convey Waste
Leecate Field	Distribute Waste Water



FUNCTION ANALYSIS SYSTEM TECHNIQUE DIAGRAM (FAST)

APPENDIX D
PHOTOGRAPHS


RIMINI
Independents
SAY NO TO EPA
WATER & SEWER


10/04/2006 11:15

APPENDIX E
WITHDRAWN RECOMMENDATIONS

VALUE ENGINEERING RECOMMENDATION # WD-1

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Do not install water service lines-just the curb stop.

RECOMMENDATION WITHDRAWN

Creative Idea 6

ORIGINAL DESIGN:

Contract Drawing W6, Water Plan and Profile, shows the typical service lines to the individual residences.

RECOMMENDED CHANGE:

Install the water service line connection, as shown on Drawing DW6, Detail B, and plug the line at a point within the individual property line. Individual property owners would be responsible for installation of the service line into their homes.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			

VALUE ENGINEERING RECOMMENDATION # WD-1

ADVANTAGES:

- Eliminates the time and cost for the labor to install the lines.
- Eliminates the material cost and the time and cost of ordering and delivering the materials.
- Removes the burden of identifying the installation 'tie-in' location from the Government and the contractor.
- Eliminates the burden of restoring the property owner's property after the pipeline installation.
- Gives more control to the SWD for future installation.

DISADVANTAGES:

- Places the burden of the pipeline installation and the associated property restoration on the individual property owner(s).
- May raise public relations issues between the property owners and the USEPA.
- May discourage the property owners from connecting the service lines to their homes.

JUSTIFICATION:

After analyzing this recommendation further, it has been established that it would place an unfair economic burden on the majority of the homeowners. Therefore, the recommendation as it is broadly stated is being withdrawn. The recommendation remains for the (2) new properties where the service installation could be considered an upgrade. A cost has not been included because the cost for these 2 installations was not included in the latest project estimate.

VALUE ENGINEERING RECOMMENDATION # WD-2

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use stabilized contaminated soil material for road backfill.

RECOMMENDATION WITHDRAWN

Creative Idea 7

ORIGINAL DESIGN:

The original design calls for the excavation of the upper 2 ft of soil from the entire length of the road through Rimini. In addition all visible mine waste, which was placed to fill flood scour in the road, will be removed. All material is stockpiled for ultimate transport to the Luttrell repository. It was estimated that 12,000 cubic yards of material would be generated from the road for placement in the repository.

Transportation of the waste to the repository requires removal of all rock greater than 12 inches in diameter, either at the excavation or the stockpile, transporting the material to the stockpile in 10 wheel trucks, transferring the material to belly dump 18 wheel trucks and transporting the material using a convoy system. Use of the haul road requires traffic control, maintenance and dust control while waste management is required at the repository.

Placement of the waste at the repository is weather dictated with placement usually starting late June.

RECOMMENDED CHANGE:

Utilizing Portland cement or other commercially available stabilization agents, stabilize the waste excavated from the road to bind up the heavy metals and prevent leaching. Once stabilized the material would be placed back into the road. Stabilized material should be placed in the deeper portions of the excavation; however, the entire road section will be essentially capped with the 12-inch road section.

VALUE ENGINEERING RECOMMENDATION # WD-2

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	See buildup		
RECOMMENDED DESIGN	See buildup		
ESTIMATED SAVINGS OR (COST)	$10,000		

ADVANTAGES:

- Reduction in the amount of backfill material that would be imported to complete the road. If sufficiently screened the stabilized material could be used as fill in proximity to utility pipes.
- Finer screening could be easily performed with a grizzly and/or a shaker screen.
- Reduction or elimination of need to transport material to the repository.
- Reduction or elimination of repository management.
- Reduction in road maintenance and dust control associated with repository use.
- Enable handling of waste prior to the typical opening date for the repository without depending on stockpiling.
- Screened rock potentially useful to the community.

DISADVANTAGES:

- Need to bring in and stockpile stabilization agents.
- Need to screen coarser material out of waste prior to stabilization which would require an additional piece of equipment and operator.
- Equipment and operator time required to stabilize waste will be greater than that required to manage stockpile. (Not applicable if there was a dedicated machine and operator at the location anyway since production at the road is not likely to overwhelm daily production at the stockpile).
- Perception by the community that waste is being put back into the community.

VALUE ENGINEERING RECOMMENDATION # WD-2

JUSTIFICATION:

The use of chemical amendments to stabilize metals is common practice to reduce their leachability. Phosphate, super phosphate, lime kiln dust, Portland cement and proprietary commercial compounds have all been used at various locations. The mixing process is typically very simple and can be performed using a backhoe or excavator. Once stabilized with phosphate, the metals are bound in a phase of the mineral apatite and are considered geologically stable. Studies found in the literature and personal experience show that amendments as low as 5% by weight can effectively bind the metals of concern, though bench testing to determine proper amendment ratios are suggested. Amending at less than 5% makes achieving an even distribution of the stabilizing agent in the soil extremely difficult. One cost estimate found in the literature determined treatment costs with superphosphate to be approximately $38 per ton

Phosphate is a commonly used stabilization agent for binding lead. Unfortunately, when used on soils that have a combination of lead and arsenic contamination, phosphate is found to increase the mobility of the arsenic. Treatment of arsenic in soils has relied primarily on iron- and manganese-based amendments to attenuate arsenic through adsorption and co-precipitation.

A number of studies have been identified where mixtures of phosphate and iron compounds were used in tandem to address combined arsenic and lead contamination. Results indicated that iron addition at rates of 0.5–5% (w/w, iron as hydrous ferric oxide) resulted in a reduction in both the leachability and bioaccessibility of arsenic relative to the unamended soils. Addition of lime to increase the pH of the system further reduced arsenic and lead mobility compared to phosphorus and iron alone. In batch experiments, it was found that application of 0.80% lime with the superphosphate reduced arsenic concentrations in water extracts by 22% compared to superphosphate treatment alone. At a higher rate of lime (3.30%), arsenic in the water extracts was reduced by 73% compared to superphosphate treatment alone. Incorporation of lime also raised the pH of water extracts and was associated with an increased immobilization of lead and cadmium. Addition of multiple binding agents would likely drive the cost higher than the $38/ton.

COST BUILD UP:

For the purpose of cost evaluation it will be assumed that total treatment cost will be $45/ton. Assume 12000 cy of soil generated during roadwork plus 200cy of soil generated at the mixing locations. Assume that of the 12000 cy from the road, 20% will consist of screened rock and that all of the rock will not go back into the excavation leaving 9600 + 200 cy to treat= 14700 ton. In actuality, all but the largest stone could probably go back into the excavation.

VALUE ENGINEERING RECOMMENDATION # WD-2

Cost to treat soil	$661,500
Select fill to offset rock loss	$63,744
Basic bench scale testing	$4000
Total	$729,244
Cost for waste hauling to Luttrell	$350,207
Imported select fill	$269,641
Assume ½ of one season dust control,	$89,809
Assume ½ of one season road maintenance	$30,500
Total	$740,157

Additional savings are likely to be found in reduced MgCl usage associated with the haul road. If restoration of the current staging area was delayed until the stabilization was performed during roadwork and that material was stabilized in place then an additional savings could be realized. It is also possible that effective stabilization could be achieved with a Portland/iron compound mix though that would be dependant on the outcome of a bench test. The minimum savings for this recommendation would be $10,000.

This item was withdrawn due to the limited savings realized, the added complexities of the technology proposed, uncertainty associated with the technology, and issues associated with disposal of the waste material.

VALUE ENGINEERING RECOMMENDATION # WD-3

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use wastewater holding tank for pump-out by WSD.

RECOMMENDATION WITHDRAWN

Creative Idea 13

ORIGINAL DESIGN:

Wastewater conveyed via main to 48,000 gallon septic tank. Effluent pumped to drain field, synthetic filter via force main under Tenmile Creek.

RECOMMENDED CHANGE:

Use septic tank as holding tank and pump tank out as needed and haul waste to a treatment facility. Do not install drain field.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			

VALUE ENGINEERING RECOMMENDATION # WD-3

DISCUSSION:

The designed discharged from the community is eleven thousand gallons per day. The holding tank will fill in 3 to 4 days. The cost to pump the holding tank this frequently would be excessive. Therefore, this recommendation is withdrawn.

VALUE ENGINEERING RECOMMENDATION # WD-4

PROJECT: Upper Tenmile Creek
LOCATION: Rimini, Montana
STUDY DATE: April 16 – 20, 2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Install evaporation lagoon in lieu of the recirculation filter, and tile field. Evaluate Aeration Lagoon.

RECOMMENDATION WITHDRAWN

Creative Idea 14 and 15

ORIGINAL DESIGN:

The design consists of a 48,000 gallon septic tank (already in place) and a recirculation bed filter and a tile field. The wastewater is routed through the septic tank to the lift station and then directed to a batch recirculation filter tank where it is cycled through a series of six to eight proprietary media fabric filters one or more times (ADVANTEX) prior to discharge to the leach field. The design flow rate to the waste treatment system is approximately 11,250 gallons per day. (Draft ROD amendment section 5.4.2)

RECOMMENDED CHANGE:

Eliminate the recirculation filter tank and filters, associated instrumentation, power, and tile field with a non-discharging facultative lagoon. The proposed lagoon system will be a two cell facultative lagoon. Design will comply with the requirements of the Montana Department of Environmental Quality Circular, Design Standards for Wastewater Treatment Facilities, Section 90, and subparagraph 93. Lagoon will be located at the same location of the current replacement leach field system.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			

VALUE ENGINEERING RECOMMENDATION # WD-4

ADVANTAGES:

- Reduction in operation and maintenance efforts.
- Reduced monitoring.
- Capital cost, power, maintenance, and operations savings.
- Reutilization of 48,000 gallon tank for fire protection water storage for forest service.

DISADVANTAGES:

- Potential odors.
- May not have adequate space available.
- Large fenced impoundment.

JUSTIFICATION:

The current design system involves a number of different components which may require ongoing maintenance, operational monitoring, and periodic checks of the system. There will be power costs, potential equipment replacements in the future.

Based on the design flow rate of 11,250 gallons per day, the following sizing for a complete retention lagoon would be needed:

11,250 x 365 = 4,106,250 gallons per year

The net evaporation per year using pan evaporation data and precipitation data compiled from the Oregon Climate Service at Oregon State University is 36 inches.

Allowable seepage per acre from the Montana Design Guidance is 500 gallons per acre/day.

Net annual water loss per acre:

Evaporation 3' x 43560 sq ft/acre x 7.48 gal/cf = 977,500 gal per acre

VALUE ENGINEERING RECOMMENDATION # WD-4

Seepage per acre	500 gallons/day per acre x 365 days/year = 182,500 gal per year
Total Loss	977,500 + 182,500 = 1,160,000 gallons per acre

Lagoon Surface Area required 4,106,250/1,160,000 = 4.2 Acres

Additional area would be needed for freeboard, dikes, fencing. Minimum required would have dimensions of approximately 500' x 500'. There is not enough space available near the site.

After further evaluation these recommendations are withdrawn. The size requirements given by the state of Montana Circular DEQ 2 make either option unworkable due to area constraints at the site. Preliminary evaluation indicates that a full retention facultative lagoon system would need to have a four-acre pond area. The sloping site would require significant volume of cut and fill which would result in a much larger footprint than four acres. The cold climate makes operation of aerated lagoon systems difficult and not generally recommended by the EPA Montana Office. The DEQ Circular also limits the sitting of such facilities to greater than one quarter of a mile from the nearest resident or proposed resident. There is an existing residence less than a quarter of a mile from the proposed lagoon site.

VALUE ENGINEERING RECOMMENDATION # WD-5

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use Rimini Alluvium for Water Supply.

RECOMMENDATION WITHDRAWN

Creative Idea 24

ORIGINAL DESIGN:

Original Design called for one or more water supply wells to provide the Rimini community with water at the confluence of the Ruby Creek and Tenmile Creek or at the confluence of Tenmile Creek and Minnehaha Creek.

RECOMMENDED CHANGE:

Install water production wells in the alluvium in the community of Rimini instead of upstream or downstream of the community.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			

VALUE ENGINEERING RECOMMENDATION # WD-5

ADVANTAGES:

- Draws down water table in Rimini thus reducing the probability of homeowners.
- Lowers well installation costs because of shallow completion.
- Wellhead maintenance is easier because of access.

DISADVANTAGES:

- Greater load of inorganics that will need to be removed from the water before it can be used – meaning increased maintenance frequency.
- City of Helena may consider this a surface water extraction.
- Leads to the need to pump extracted water up to the design pressure rather than relying on upstream location of water source.
- An extraction system in Rimini, if the influence is wide enough, may result in drawing groundwater influenced by the Susie mine into the extraction system which could result in iron scaling and acid damage/degradation.

JUSTIFICATION:

Upon analysis and discussion with the State of Montana abandoned mines program representative this recommendation is withdrawn. Vic Anderson said that in the 1980s they determined that the Rimini water was not suitable for development as a water resource.

VALUE ENGINEERING RECOMMENDATION # WD-6

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Require Abandonment of all Current Wells in Accordance with State Requirements.

RECOMMENDATION WITHDRAWN

Creative Idea 41

ORIGINAL DESIGN:

Original Design calls for the wells at the site to be abandoned voluntarily by the users after potable water is supplied by the WSD. Some of the current users are knowingly using water that is contaminated above MCLs for arsenic and lead. The water may be suitable, however, for irrigation; provided that the concentration of the inorganics in the water do not create an ingestion pathway from homegrown produce.

RECOMMENDED CHANGE:

The following recommendation is predicated on the idea that once potable water is supplied, the wells being used would only provide a dermal pathway for hazard to users. This recommendation reverses the design approach which leaves wells in place after a new potable water line is installed. The idea being that it can be used for irrigation and exterior washing.

The recommendation would require that the wells be abandoned instead of left in place for other non-potable uses.

VALUE ENGINEERING RECOMMENDATION # WD-6

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN			
RECOMMENDED DESIGN			
ESTIMATED SAVINGS OR (COST)			

ADVANTAGES:

- Eliminate any potential pathway for untreated water to reach a future receptor.
- Eliminates a conduit for contamination migration in the future.
- IF the water supplied by the WSD is metered THEN there is a disincentive for the user to completely discontinue use of the well water, so abandonment would make this pathway go away.
- If abandonment takes place now then proper abandonment is guaranteed as a result of oversight on the contractor.

DISADVANTAGES:

- This approach will be politically very damaging to the Federal Government.
- This approach will most certainly result in large costs associated with attorneys.
- This approach has many un-intended consequences associated with it.
- Encourages use of treated water for irrigation, increasing demand on system capacity and associated cost.

JUSTIFICATION:

Withdrawn due to insurmountable disadvantages.

VALUE ENGINEERING RECOMMENDATION # WD-7

PROJECT: Upper Tenmile Creek
LOCATION: Rimini Superfund Site, Helena, Montana
STUDY DATE: April 17-19,2007

DESCRIPTIVE TITLE OF RECOMMENDATION:

Use Larger Pipe and Use it as Storage instead of 50K-gal Tank.

Mutually exclusive of #58 if 58 is desired to decrease depth of excavation.

Creative Idea 59

ORIGINAL DESIGN:

Calls for

- Using 4-inch outer diameter (O.D.) Zaplok® pipe with 3.375-inch inner diameter (I.D.).

RECOMMENDED CHANGE:

Consider increasing the size of the pipe to in order to increase its storage to approximately 50,000 gallons and obviate the need for a tank. In order to accomplish this, the designed I.D. would have to be increased to roughly 10 inches. This would mean a 12-inch pipe. This would require the excavation dimensions to increase by 8-inches (both depth and width). This adds about 200 cubic yard to the volume to be moved and handled.

SUMMARY OF COST ANALYSIS			
	First Cost	O & M Costs (Present Worth)	Total LC Cost (Present Worth)
ORIGINAL DESIGN	$828,000		$828.000
RECOMMENDED DESIGN	$1,256,000		$1,256,000
ESTIMATED SAVINGS OR (COST)	($428,000)		($428,000)

VALUE ENGINEERING RECOMMENDATION # WD-7

ADVANTAGES:

- Eliminates the need for a storage tank
  - no protection/security issues
  - no freeze-thaw issues
  - no slope stability or geotechnical considerations
  - no need to find a space for the tanks
  - eliminates grading.
- Allows for more room to be devoted to the water treatment system at extraction point.

DISADVANTAGES:

- If the pipe is not full then the pressure head is lost.
- Increases excavation and placement costs for pipe.
- Increases material costs for piping.
- Potential for losses due to leakage is increased but does not affect downstream pressure.
- Community would need a backup supply if the pipe fails for some reason.
- Increased burial depth – therefore more excavation.
- State may not allow storage in the pipe.

JUSTIFICATION:

This option is more expensive than the original design by $428,000. Over the life cycle cost of the project (30 years), the $428,000 is worth $14,000 per year. Given the O&M advantages, this option may still be viable at the additional costs.

VALUE ENGINEERING RECOMMENDATION # WD-7

Cost Item	Units	$/Unit	Source Code	Original Design		Recommended Design	
				Num of Units	Total $	Num of Units	Total $
4-inch Zaplok connection	ft	0.80		13,000	$10,400	0	$0
12-inch Zaplok connection	ft	2.00		0	$0	13,000	$26,000
4-inch steel pipe	ft	10.00		13,000	$130,000	0	$0
12-inch steel pipe	ft	40.00		0	$0	13,000	$520,000
50K-gal H_2O Storage Tank	ls	236,126.00		1	$236,126	0	$0
road excavation	cy	5.00			$0	200	$1,000
road backfill	cy	5.00			$0	200	$1,000
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
					$0		$0
Subtotal					$376,526		$548,000
Mark-up		@	120%		$451,831		$657,600
Redesign Costs							$50,000
Total					$828,357		$1,255,600

[1] Bob Logan - Zaploc installer

[2] Gerlinger Steel & Supply

APPENDIX F
RESUMES

Kenneth L. True, P.E., CVS.
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Home: 402-339-1936
E-mail kentrue@maladon.com

Summary

Six years working as an independent Value Engineering (VE) consultant and working part time for URS Corporation as a VE specialist. Thirty-one years with the Corps of Engineers (CE). Retired as the Northwest Division Value Engineer, coordinator for Division's Architect /Engineer selection process, and team leader for Engineering Divisions Engineering Quality Management System. Other CE work included cost engineering, Division construction quality control management team leader, District construction supervision and inspection, Engineering Division project management, District Value Engineer and nine years of construction field experience.

Major Accomplishments

- Participated in numerous CE VE studies in various roles.
- Achieved Certified Value Specialist Certificate from the nationally accredited program maintained by the Society of American Value Engineers, International.
- Successfully lead more than fifty VE studies.
- Leading role in the CE Value Engineering Advisory Committee.
- Prepared and presented a special one-day VE workshop for EPA regional office personnel. Delivered this presentation to the majority of the regional offices. This workshop highlighted some of the very successful Value Engineering applications performed on superfund sites.
- Taught in the CE PROSPECT program for fifteen years. Subjects included roofing, construction quality management, soils and masonry.
- Member of America Society of Civil Engineers, Society of American Value Engineers, and past member of American Society of Military Engineers.
- Active in many local community organizations.

Education

BS in Civil Engineering, University of Nebraska at Omaha
Mod I, VE workshop, Mod II, VE workshop
SAVE International yearly conferences and workshops
Numerous CE 40 hour workshops including HTRW overview program

Registrations

Professional Engineer, State of Colorado
Certified Value Specialist, SAVE International

Neil A. Marsh

Summary

Specializes in the management and performance of remedial investigations/ feasibility studies (RI/FS) and remedial designs/remedial actions (RD/RA). Supervised or directed RI/FS and RD/RA activities at 7 National Priorities List (NPL) sites and numerous sites listed by the State of Montana under the Montana Comprehensive Environmental Cleanup and Responsibility Act. Extensive experience in the remediation of mine waste sites and wood-treating sites. Expertise includes managing multi-disciplinary remedial investigations and feasibility studies, managing design, construction, and construction oversight contracts for large remedial actions, analyzing statutory and regulatory investigation and cleanup requirements, and coordinating and facilitating cleanup solutions for complex, multi-issue projects involving numerous public and private entities often with disparate cleanup goals.

Major Accomplishments

- Project manager for the Upper Tenmile Creek Mining Area NPL site RA work assignment, providing technical and management support to EPA for implementing the selected remedies for mining-related contamination in a major watershed that serves as the primary drinking water source.

- Project manager for the RD work assignment for the site. The project area consists of a 50 square mile watershed that includes 150 abandoned historic mining facilities. Support to EPA involves the cost-effective and timely management of the RD/RA activities consistent with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements, as well as assistance in coordinating the RD/RA with other watershed improvement efforts by other entities, including federal and state land management and environmental agencies, local governments, and other local interests.

- Project manager for conducting the RI/FS and drafting the proposed plan and record of decision for the Upper Tenmile Creek Mining Area site.

- Managed and directed the Superfund Program for MDEQ for seven years and managed a major RI/FS project for four years. Responsible for the overall management, budgeting, and coordination of all MDEQ Superfund activities at two large state-lead NPL sites and at seven other EPA-lead NPL sites. Responsible for management-level review, direction, and approval of all technical aspects of Subarea 1 of the RD/RA at the Streamside Tailings Operable Unit, which includes the removal and disposal of mine tailings and reconstruction of approximately 4 miles of stream channel.

- Managed a study of the efficiency of air-to-air heat exchanger ventilation system in two superinsulated houses utilizing computerized data monitoring system.

- Assisted field team manager; provided on-site field assistance to drilling teams and geologists collecting core samples; and conducted site history file and document research in support of litigation over hazardous materials release liability.
- Prepared the land use, socioeconomic and regulatory analysis sections of an environmental impact statement for a proposed airport.

- Task Manager for preparing environmental reports on proposed electric transmission lines and related facilities.

- Worked extensively in the local governmental permitting process for major transmission facilities, including the preparation of socioeconomic studies and permit applications and assisting with public hearing presentations.

- Task Manager for evaluating impacts on land use, local finances, and the socioeconomic environment and reviewed statutory/regulatory settings and project implementation.

Education

B.S., Environmental Engineering, Stanford University

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Email tim.gallagher@nab02.usace.army.mil

Summary

- "Superfund Construction Engineer" providing technical assistance directly to Region III Remedial Project Managers through an Interagency Agreement that was developed between the USEPA and the USACE.

- Provide assistance on approximately 15 Superfund Sites in the form of design reviews, estimate preparation, present worth calculations, work oversight, attendance at meetings, consultation, etc.

- Project Engineer, Baltimore District, Northeast Resident Office. Current projects include FUDS and DERP sites, along with Superfund Program sites.

- Assigned to a Value Engineering team that visits Superfund projects in different regions throughout the US to evaluate certain aspects of the project(s) and to identify areas where the USEPA could improve the project if recommended actions are implemented.

Education

B.S., Civil Engineering Widener University, Chester, Pennsylvania
Leadership Education and Development Course
8-Hour HAZWOPR Refresher Training
Hazardous Waste Manifest/DOT Refresher Course
40-Hour HAZWOPR training
USACE Construction Safety Training

Registration

Professional License; Environmental Engineering, (# PE-070657)

David A. Swanson

Summary

25 years of experience in the construction industry. Worked as a mine foreman for 10 years. Substantial experience obtaining samples for environmental investigations and compliance. General mine foreman/process superintendent. Provided construction oversight and technical assistance. Worked as a plant construction and start-up consultant

Major Accomplishments

- Construction Manager for the EPA Region 8 Town as well as EPA Region 8 Community. Responsibilities included contractor management, site surveying, and QA.

- Field team leader the EPA Region 8 Tenmile responsibilities included streamflow measurements, abandoned mine surveys, adit discharge, and waste rock sampling.
- Worked oversight for several EPA superfund construction/ remediation sites.

- Manage the process and maintenance departments overseeing operations of a 1,000-gpm carbon adsorption plant, supervising crushing, agglomeration pad loading, solution balance, leaching, pad construction, refinery operations, solution detoxification, water sampling, land application, pad rinsing, and related closure operations.

- Worked directly with numerous contractors for construction oversight of leach pads, ponds, and various reclamation activities.
-
- Substantial experience obtaining samples for environmental investigations and compliance. Supervised sampling of soils, groundwater, and surface water. Maintained strict adherence to SAPs, obtained soil, groundwater, and surface water samples for EOA. Conducted field programs for asbestos sampling.
-
- Assistant surveyor completing initial boundary and site feature surveys, a member of the core and reverse circulation drill teams, welded HDPE and VLDPE liners for leach pads and ponds.
-
- Provided construction oversight and technical assistance and was directly responsible for the construction oversight and installation of a 1,500-gpm carbon adsorption plant, including concrete and structural steel, acid wash system, and reverse osmosis system installation and inspection, as well as piping and instrumentation.
-
- Plant construction and start-up consultant. The project included installation of a 3-tonne-per-day electric carbon regeneration furnace, a 2,500-gpm carbon adsorption plant, pregnant and barren solution recovery systems, refinery equipment, and boiler installation.
-
- Plant construction, project manager and start-up consultant for numerous projects.

Education

2 years of Mechanical Engineering and Drafting
MSHA First Aid and Mine Rescue Training
OSHA 40-Hour Hazardous Material Training
Portable Nuclear Gauge Operations & Safety Training
State of Montana Firefighting and Fire Rescue Training

Registrations

State of Montana Employer ID No.: 81-0522619 L.L.C

John R. Hartley
Omaha NE. 68124
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Summary

Fifteen years of providing technical support and project management with the US Army Corps of Engineers. Experience includes contaminated site characterization and remediation, geotechnical sampling, geotechnical design, drainage design and erosion control, and environment restoration including disturbed lands, wetlands and streams. Experience in writing investigation and removal action work plans, design documents and investigation reports. Knowledge of RCRA, CERCLA, SARA, TSCA, and Clean Water Act to ensure projects are designed and executed with full regulatory compliance.

- Project Manager with responsibility for business development, project scoping, estimating, design review and acceptance, contract negotiation and management. Identify the most efficient contract mechanism for the project and prepare project acceptance documentation. Coordinate with customer, contractors, regulatory agencies, regional Corps of Engineers districts and private concerns to preclude conflict of interests or jurisdictional disputes and to maintain effective public relations.
- Field Construction Manager with responsibility for review and approval of work plans and design packages. Provide technical assistance to ensure the most efficient method of implementing site remediation. Provide constructability and value engineering reviews of plans. In coordination with the contractor modify conceptual design and execution plan in the field as needed during execution of design-build projects to accommodate changing site conditions.

Major Accomplishments

- Project and Field Management of disturbed land projects for U.S. Park Service including estuary restoration.
- Performed contaminated wetland characterization and remediation, and landfill capping, at several sites for USFWS.
- Project Manager and geologist at Pemaco Superfund Site, CA. Investigation Utilized extensive direct push sampling and real time analysis, including the use of a membrane interface probe, to continuously log solvent contamination in the soil.
- Project and Field Manager for design and construction of on-site repositories for mine waste site. Perform the regulatory review and design justification..
- Project and Field Manager for design and construction at two large FEMA group home two sites in support hurricane relief efforts.
- Project Manager for in-house design of Rocky Mountain Arsenal Hazardous Waste Landfill. Developed a soil/water contaminant partitioning model to estimate leachate generated in RMA landfill for use in material testing.
- Project Manager for Rocky Mountain Arsenal Basin F and Submerged Quench Incinerator closure.
- Performed 2-d modeling in support of pump-and-treat, bioremediation, and soil-vapor-extraction remedial designs.

Education

Ph.D. Candidate in Geochemistry at University Of Texas at Austin
M.S. in Geology at University Of New Orleans
B.S. in Geology at University Of Nebraska at Omaha

R. Curtis Payton, II
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Summary

Registered geologist with over 20 years experience in environmental, geotechnical and seismic investigations. Prepares work plans, scopes of work, PA reports, SI reports, RI reports, cost estimates, proposals, design documents and public presentations for both government and private sector projects. Has directed multi-rig drilling efforts, performed trenching, borehole logging (including downhole), sampling (all media), aquifer testing, installation and development of water production and monitoring wells, groundwater modeling and contaminant fate and transport studies. He is an expert in the field of trench logging for both fault and forensic environmental investigations. Project Manager or Team Lead of several base wide environmental programs and brings experience in managing multiple contractor teams and Corps staff toward the goal of site closure and NPL delisting.

Major Accomplishments

- Coauthored, prepared and presented installation work plans and budgets to DA personnel in Maryland for BRAC & IRP installations.
- Implemented forensic environmental investigations to determine responsible parties along a petroleum pipe line corridor involving 4 pipelines and 5 RPs.
- Audited contractor efforts in the construction of UV-ox waste water treatment plant, 100-foot deep hydropunch operations, cleanup of pesticide contaminated infrastructure for a carnation farm.
- Managed and completed performance of 21 Preliminary Assessments in 30 days to meet customer deadline.
- Created standard internal government estimate format used by more than 20% of current Sacramento Project Management Staff in the HTRW PPMD group.
- Completed mathematical analysis of two different risk assessment methodologies to identify which was more conservative depending on the types of analytes assessed.
- Fault investigations at every major fault system. Identified (within 100 feet) the location of the northern split of the Tule Pond Splay on the Hayward fault.
- Earthquake assessments of residential and commercial structures for damage to foundations and structural walls. Currently a member of the USACE Structural Safety Assessment Team.
- Installed over 100 wells in a wide variety of depositional environments.
- Experienced in negotiation on HTRW actions with federal state and local regulatory agencies, including EPA Region 8 and Region 9, Utah-DEQ, California-CalEPA, -DTSC, -Fish and Game, -RWQCB (all regions), the regional program for Santa Clara Valley Water District.
- Current member of USACE Center of Expertise Value Engineering Team for EPA Superfund Program.

Education

B.S. Earth Sciences (Geology) at the University of California at Santa Cruz
Ctr. for Army Leadership LEAD Class – Reno, NV
USACE Leadership Development Program II

Registrations

California State Registered Professional Geologist No. 5608
California Registered Environmental Assessor I No. 193

Edward J. Hanlon
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Summary

Working knowledge of and practical experience with national regulations, policies and guidance related to USEPA's Superfund and water quality standards programs. Provides technical reviews of draft Superfund decision documents prepared by USEPA Regional offices. Write technical guidance associated with USEPA's Superfund and water quality standards programs. National contact on indoor cleanups under Superfund.

Major Accomplishments

- USEPA Headquarters Coordinator for Superfund Remedial issues involving USEPA Region 4.
- Office Lead Contact on coordination on Superfund Regional projects.
- Special Assistant to Deputy Office Director of USEPA's Office of Superfund Remediation and Technology, and provided programmatic expertise and day-to-day advice and counsel to the Deputy Office Director in performing the Office's mission.
- Associate Branch Chief in USEPA's Office of Pollution Prevention and Toxics (OPPT), Exposure Assessment Branch; provided day-to-day advice and counsel to the Branch Chief and Branch staff on programmatic activities of the Branch, and conducted technical studies and performed technical assessments to support USEPA's New Chemicals Program and regulatory activities associated with Fluoropolymer chemicals.
- USEPA Headquarters Coordinator of USEPA Region 1, 4 and 8 USEPA water quality standards (WQS) issues in USEPAs Office of Water; served as regulation manager on 'Federal WQS.
- Technical Reviewer of USEPA's Office of Solid Waste and Emergency Response (OSWER) regulations, policies and guidance in USEPAs Office of Research and Development.
- USEPA Remedial Project Manager (RPM) for six Superfund sites in USEPA's Region 5 office and served as RPM for ten sites in USEPA's Region 2 office.
- Headquarters Coordinator for Superfund remedial design and construction issues involving USEPA Regions 1, 6, 9, and 10 in USEPA's Superfund Headquarters office; wrote remedial design and construction section of USEPA's Superfund (NCP) and Offsite Rule regulations.

Education

B.S. Natural Resource Management, Rutgers University
M.S. Environmental Engineering, New Jersey Institute of Technology
J.D., Chicago Kent College of Law

Publication and Conference Presentation

Procurement of Innovative Technologies; Conference on Design and Construction Issues at Hazardous Waste Sites.

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Summary

Working knowledge of and practical experience with design and start-up of process equipment used in treatment systems. Provides technical assistance on granular activated carbon, advanced oxidation technologies, soil washing, solids handling and other soil and water treatment technologies. Writes technical guidance and design specifications for HTRW unit processes. Registered Professional Engineer NE-5616, July 1983 to present

Major Accomplishments

- National coordinator for a HQ-EPA/HQ-USACE initiative to develop an implementation plan for application of the Value Engineering (VE) process nationally. The initiative involves developing a VE protocol concurrently with a pilot program for performing up to 10 VE Studies at fund lead sites.

- Served as the HTRW-CX team leader for a variety of technical evaluations and resulting reports such as independent remedy assessments and Five Year Reviews with HTRW-CX staff in addition to authoring portions of those reports. One of those five year reviews was presented a national award for the Brown and Bryant Site by the USEPA as "The Outstanding Five Year Review of 2006", 2000 to present.

- Provided technical oversight during model development for the RACER budgeting cost estimating computer program used by Department of Defense agencies, and other private, local, state, and federal agencies, 1996-Present.

- Vineland Chemical Company, OU-2 Soils remedial action team member since initiation of remedial action – construction phase at the site. Activities included evaluation of requests for proposal, participation in the process design formulation, pilot studies, design and facility construction and ongoing operations, 2000 – present.

- Defense Depot Ogden, OU-4 start up and prove out of an innovative peroxide/ozone groundwater treatment plant treating vinyl chloride and chlorinated solvents, 1998.

- Maywood Formerly Used Site Remedial Action Program (FUSRAP). Full scale pilot plant study for segregating radioactive soils from clean soils using innovative soil sorting technologies, 1998-2000.

- Participated in numerous Remediation System Evaluations (RSE's) including Ellsworth AFB, SD, Oconomowoc, WI, Silresm, MA, Higgins Farm, NJ, Peerless Plating, WI, Hanford, WA as well as numerous others, 2000 to present.

Education

B.S. Civil Engineering, South Dakota State University, 1978
M.S. Civil/Environmental Engineering, University of Nebraska, 1985

Affiliations

Registered Professional Engineer, Nebraska E-5616, 1983
Gulf Coast Hazardous Substance Research Center, Technology Transfer Committee 1999-present